WESTERN GAS

February 1929

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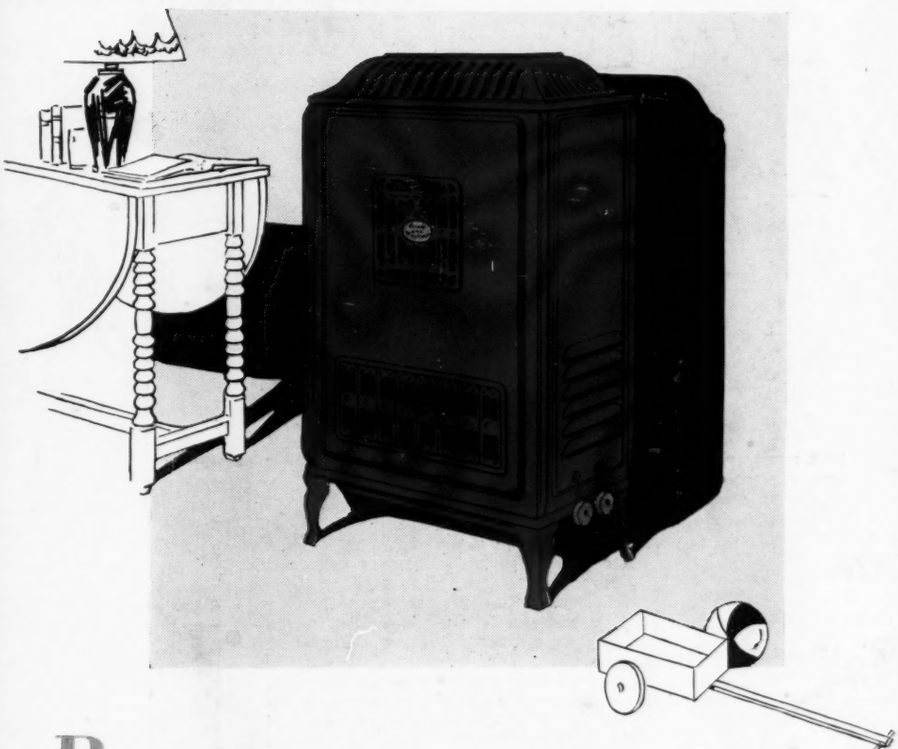

PLAN for a bigger house-heating load in 1929 with Estate Gas Heatrola.

As a whole-house heater for small homes and apartments, or as an auxiliary heater for large homes, Estate Gas Heatrola opens fertile new fields for load-building. Full information about the heater and interesting merchandising plans on request. The Estate Stove Company, Hamilton, Ohio. House Founded in 1845. 180 Montgomery Street, San Francisco, Cal.; Terminal Sales Bldg., Portland, Oregon.

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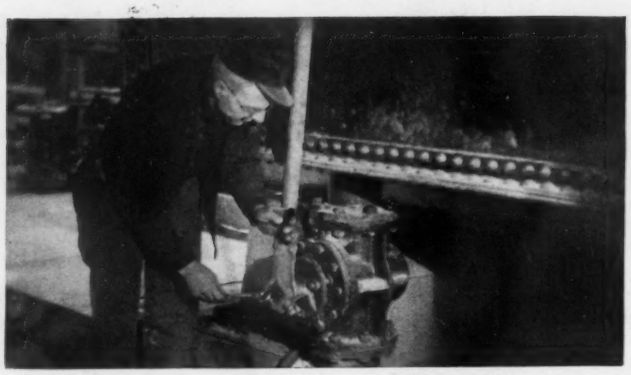
A MONTHLY JOURNAL DEVOTED TO THE WESTERN GAS & APPLIANCE INDUSTRIES

PRINT IN BINDING



A typical installation of the lubricated Nordstrom Valve

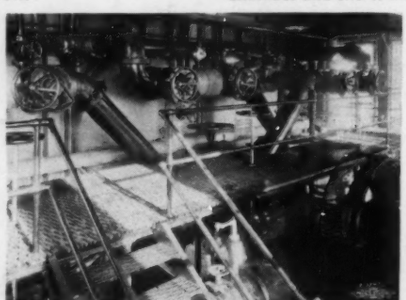
MERCO

The USE of Lubricant to Prevent Valve Leaks!

UNTIL twelve years ago, the problem of preventing leaks in valves used in the Gas Industry had never been solved. No valve was available which would permanently stop leaks and no particular effort had ever been made to remedy the difficulty...leaks being looked upon as a necessary evil of the industry and a necessary waste of operation.

Gradually, however, thought and attention were concentrated on the prevention of valve leaks. Thorough investigations disclosed the enormous costs of leakage wastes and a conscientious effort was begun to find a satisfactory solution.

Among the men who devoted their time and attention to the creation of a valve which would permanently stop leaks was S. J. Nordstrom, an engineer of marked ability and reputation in his profession. Nordstrom, however, sought not only a leakless valve, but a valve that could also be lubricated and its plug loosened in case it should ever become stuck, thus providing a remedy for the major valve troubles in one type of valve.



Nordstrom Valves handling natural gas to absorbers.

The result was the Nordstrom Valve...a valve that has proved very satisfactory in its operation.

A Patented Hydraulic Principle

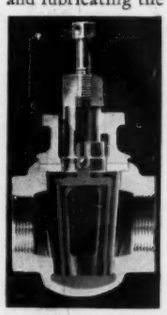
The Nordstrom Valve utilizes the principle of hydraulic pressure, obtainable up to 2,000 pounds to the square inch, by the quick and easy turning of a lubricant screw at the top of the valve. This screw can be turned by the finger tips and requires no special tools or skill. The entire operation is simple:

A lubricant stick is dropped into the shank of the plug and the lubricant screw turned down on it until the lubricant in the shank is forced laterally through passages leading to lubricant ducts on either side of the plug. The lubricant under pressure performs the very important function of forming a seal of highly viscous nature between the contact surfaces of the plug and its seat and thus efficiently renders the valve tight against leakage, without undue pressure of the plug on its seat. Once a film of lubricant is distributed throughout the valve, it also protects the ground surfaces against corrosion. Reaching the base of the plug through these ducts, the lubricant fills a sealed lubricant chamber and exerts an upward pressure on the base of the tapered plug. This releases the plug instantly, if tight. Thereafter, a slight turn of the lubricant screw and plug will repeat the operation at any time.

Outstanding Features of the Nordstrom Valve

The standard Nordstrom Valve is quarter-turn, and a stop is cast on the cover to indicate clearly to the operator the direction in which to turn the plug for opening and closing. The lubricant ducts are so arranged that the contents of the line do not come in contact with the ducts. The result is that the lubricant is always in the ducts and is not dissipated by the material in the line.

A check valve, inserted in the shank of the plug as an additional precaution, permits the removal of the lubricant screw, thus enabling the operator to insert lubricant while the valve is under pressure and temperature. This valve also insures the operator against danger when the contents of the line are of an injurious nature. The plug is held in its seat at all times by an elastic packing so arranged that it cannot be affected by the contents of the line, due to a corrosive-resisting metallic diaphragm interposed between the plug and the packing. This patented feature prevents leaking, prolongs the life of the packing and permits of free turning. No operations are necessary to seat or unseat the plug except turning down the lubricant screw. This performs the function of unseating and lubricating the valve. A turn of the valve insures against leakage.

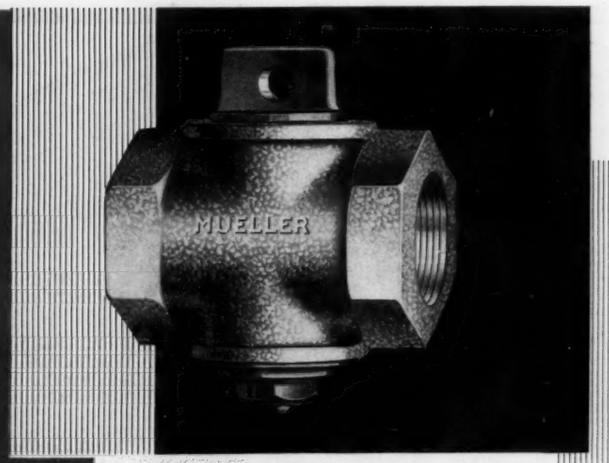


Lubricant sticks are made to fit the various sizes of reservoirs and the Merco Nordstrom Valve Company supplies the kind of lubricant best adapted to the conditions under which the valve operates. "Merco" lubricants are adapted to all kinds of services.

Nordstrom Valves are manufactured in several different types, depending upon the size of the valves and the services for which they are intended.

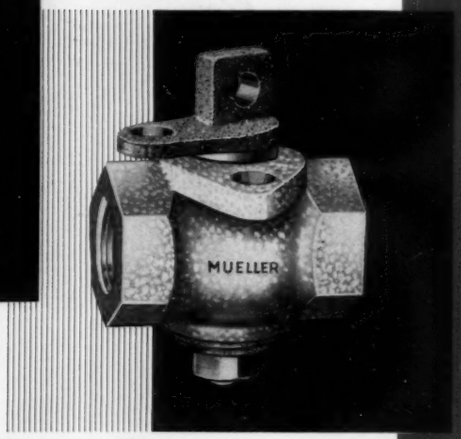
At your request, the Merco Nordstrom Valve Company will send you its latest Catalog No. 6, which illustrates and describes in detail the advantages of the Nordstrom Valve. Write to any one of the offices at the following points: New York, 11 W. 42nd St.; Boston, 184 Boylston St.; Buffalo, Genesee Bldg.; Detroit, 2842 W. Grand Blvd.; Pittsburgh, Clark Bldg.; Chicago, 176 W. Adams St.; New Orleans, Masonic Temple Bldg.; Houston, Petroleum Bldg.; Dallas, Magnolia Bldg.; Los Angeles, 556 S. San Pedro St.; San Francisco, 343 Sansome St.; Seattle, Colman Bldg.

Merco Nordstrom Valve Co.
Subsidiary of The Merrill Company
Engineers :: Manufacturers
Factories; Oakland, Calif., and Belleville, N. J.
Canadian Mfrs.-Peacock Bros., Ltd., Montreal, Que., Cobalt, Ont., Winnipeg, Man., Vancouver, B. C.



At left: **Mueller C-11100 Flat Head, Iron Body Brass Plug Service Stop.**

Below: **Mueller C-11080 Iron Body Brass Plug Meter Stop.**



Quality–

or service failures?

It's not what you pay on the market—it's the cost of repairing failures that determines the price you actually pay for stops.

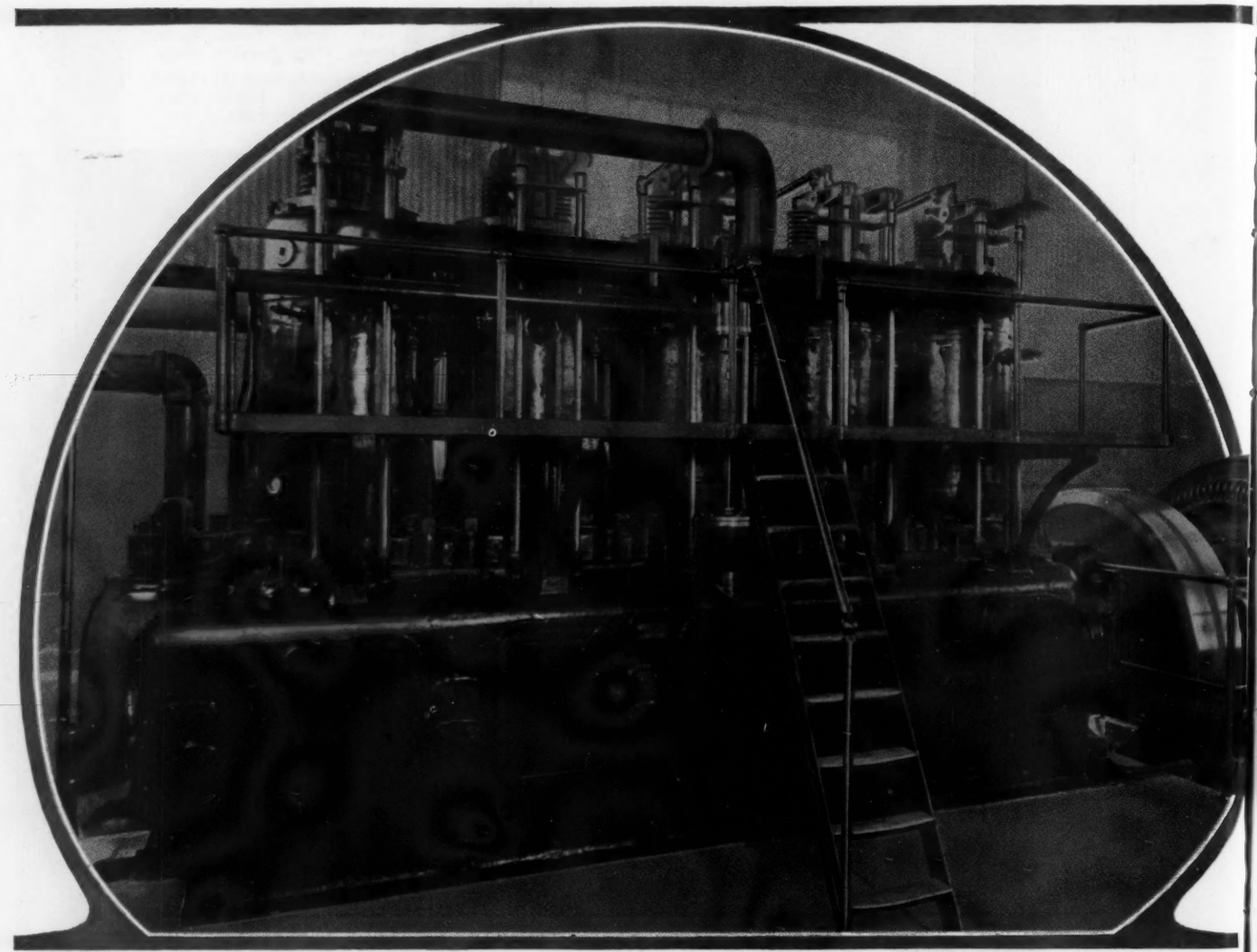
The name of Mueller has been a guaranty of value for over three-quarters of a century. The enduring service of Mueller Iron Body Stops has caused leading gas companies to standardize on them the country over.

Made of the best gray iron—hot galvanized, with keys and washers of Mueller Red Brass and designed to provide the greatest strength where strength is needed, Mueller Iron Body Stops stand up under the heaviest installation strains.

MUELLER COMPANY (Established 1857)
Decatur, Illinois, Branches: 901 McKinney Avenue, Dallas, New York, San Francisco, Los Angeles. *Canadian Factory:* Mueller, Limited, Sarnia.

MUELLER

Write for the complete catalog of Mueller gas service goods



THE HOPE 450 H.P. GAS ENGINE

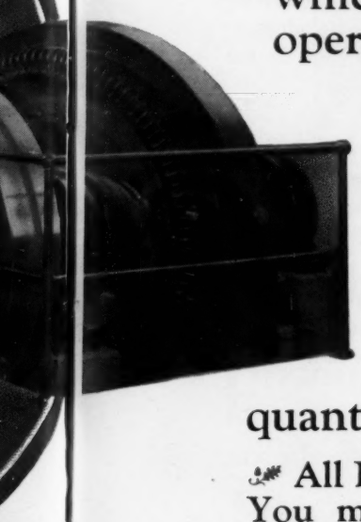
The Hope vertical gas engines are well adapted to direct driving electric generators. They require a minimum of floor space, have a low overall installation cost, and they are a more reliable and cheaper source of power than purchased current. The installation pictured above shows a five cylinder 450 B.H.P. Hope gas engine driving a 375 K.V.A., 60 cycle alternator in the United States Gypsum Company's plant at Sweetwater, Texas. Let a Cooper engineer show you how much you can save by installing your own power plant.

COOPER

February, 1929, Volume V, Number 2. WESTERN GAS is published by Western Business Papers, Inc., at 124 West Fourth Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 3 years $5.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, California, under the Act of March 3, 1879.

Hope Engines Now Built And Serviced By Cooper

THE C. & G. Cooper Company has purchased outright the manufacturing division of the Hope Engineering Company, including the well-known Hope vertical gas engines. The factory in which they were built at Mt. Vernon, Ohio, is being operated as a unit of the Cooper plant.



The complete line of Hope vertical engines is to be still further improved and many details of design, developed on Cooper horizontal engines, have already been added. They will be built in standard sizes ranging from 60 to 540 B.H.P. for every power purpose. For the present the 170 - 250 - 360 - 450 and 540 H.P. sizes will be built on a quantity production basis.

All Hope Engineering sales offices will continue to sell Hope engines. You may, however, if you prefer, buy Hope engines through any Cooper sales office. In either case, please remember that Coopers assume full responsibility for the quality of materials and workmanship and for the field service on all Hope vertical engines sold in the future.

Cooper engineers are convinced that the present design of Hope engine is the best vertical engine in the field and are interested in making it still better. This line of vertical engines will be an addition to the regular Cooper line of horizontal engines and compressors which are being built in sizes from 50 to 1500 B.H.P. This combined line of vertical and horizontal engines will now permit you to use Cooper quality machinery and service for all your engine and compressor requirements.

THE C. & G. COOPER COMPANY

MT. VERNON, OHIO

ENGINES

PROOF

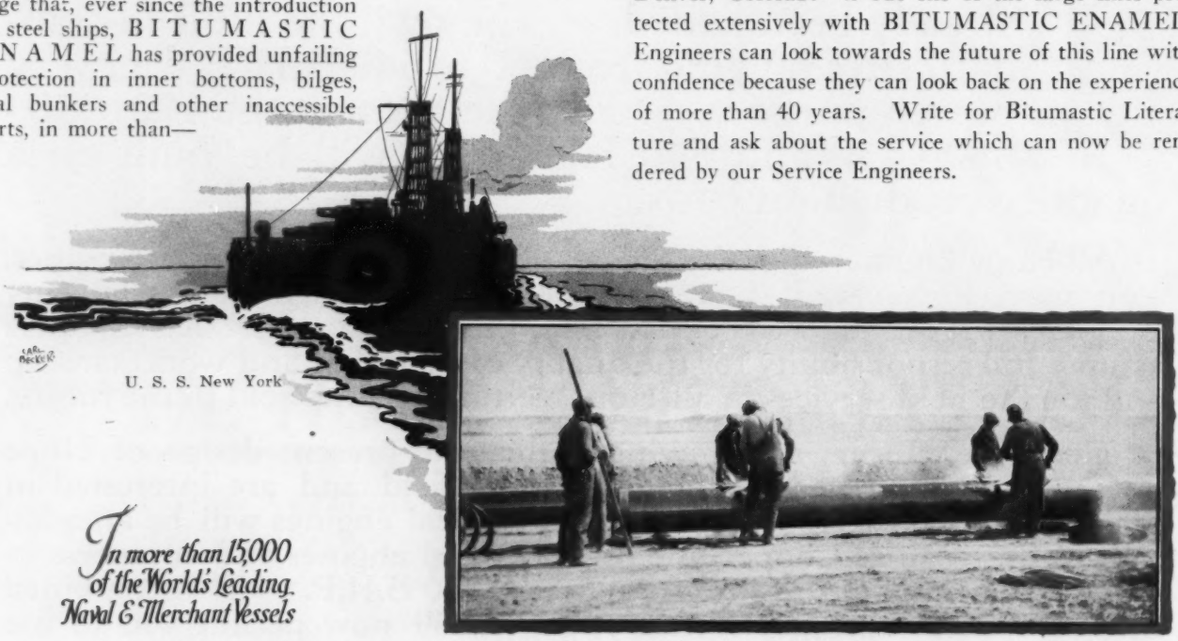
PROVEN PROTECTION FOR PIPE LINES

The Amarillo-Denver Line

There has never been a greater need for PROVEN merit than in connection with the coatings used on pipe lines. Engineers must *know* what will happen to these coatings over a long period of time and under the most corrosive conditions. There is, therefore, a true guarantee in the knowledge that, ever since the introduction of steel ships, BITUMASTIC ENAMEL has provided unfailing protection in inner bottoms, bilges, coal bunkers and other inaccessible parts, in more than—

The conditions on a pipe line buried underground, of course, do not parallel conditions on a ship. But, from the standpoint of corrosion, conditions in the bilges of a ship are *actually* far worse than on a pipe line and the unfailing performance of Bitumastic Enamel under these highly adverse conditions has led to its adoption for protection of the largest gas and oil lines in the world.

The Amarillo-Denver Line—a 22″ and 20″ gas pipe extending for 340 miles between Amarillo, Texas, and Denver, Colorado—is but one of the large lines protected extensively with BITUMASTIC ENAMEL. Engineers can look towards the future of this line with confidence because they can look back on the experience of more than 40 years. Write for Bitumastic Literature and ask about the service which can now be rendered by our Service Engineers.



U. S. S. New York

In more than 15,000 of the World's Leading Naval & Merchant Vessels

BITUMASTIC

REG. U.S. PAT. OFF.

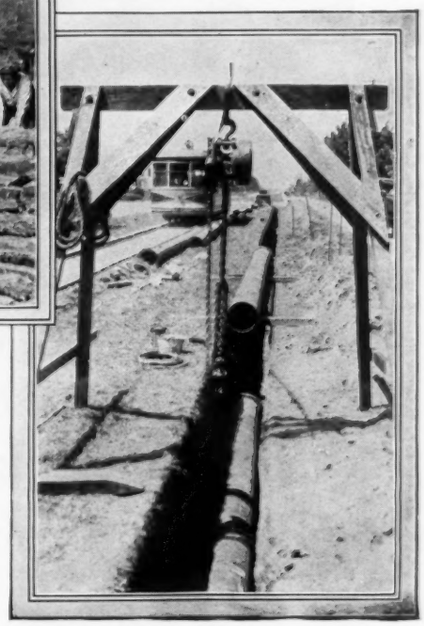
ENAMEL

Wailes Dove-Hermiston Corporation

17 Battery Place, New York

Philadelphia Cleveland Chicago Houston Tulsa San Francisco

New method reduces pipe laying costs



Upper left picture shows the simplicity of connecting the Anthony Joint. No special tools or skill required. Center photograph illustrates the ease of handling 24 ft. lengths of deLavaud pipe. Right hand illustration shows the chain hoist used to lower pipe into trench.

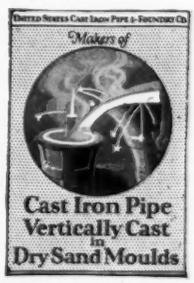
–Pontiac success widely observed

ENGINEERS and officials of leading mid-western gas companies gathered at Pontiac, Michigan, recently to inspect the laying of a new type main.

Two thousand feet of 12″ multiple length* deLavaud cast iron pipe with Anthony joints was laid in record time despite unusual difficulties in grade crossings and at street intersections.

So much interest was shown in the success and economy of this latest type of cast iron pipe for high-pressure gas and water lines that a brief engineer's report of the work has been prepared. A limited number of copies of this report is available to anyone interested in this most recent development in underground pipe lines.

Photographs and data by courtesy of Consumers Power Co.



*Note: Multiple length deLavaud pipe comes in 24 ft. lengths consisting of two standard 12 ft. lengths bronze welded at the plant under ideal conditions, and shop-tested.

United States Cast Iron Pipe and Foundry Company

General Offices:
Burlington, New Jersey

Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
Buffalo: 957 East Ferry Street
Cleveland: 1150 East 26th Street
New York: 71 Broadway

San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.
Minneapolis: 6th Street & Hennepin Avenue

3 FEATURE ISSUES in '29

Use these three WESTERN GAS *Specials . . . and, better still, be in every issue of the year!*

NATURAL GAS EDITION — May

A competent review of the past year's Natural Gas activity in both Mid-Continent and Pacific Coast Fields featuring new and proposed gas transmission lines . . . compressor plant operation . . . gasoline plant practices . . . important distribution problems. Edition will be distributed free from our booth during the Natural Gas Convention, Kansas City, May, 1929. A special colored stock insert will carry all full page advertisements of manufacturers having exhibits without additional charge.

TECHNICAL EDITION — September

A preview of the 36th Annual Convention of the Pacific Coast Gas Association at Del Monte, California, in September. The completeness, value and importance of this volume in previous years has never been equalled by any one gas industry publication. More than 200 pages in size, it will contain all the papers to be presented at this Convention for discussion.

NEW EQUIPMENT EDITION — December

A review and technical description of all gas equipment and gas appliances placed on the market during the past year, also giving improvements of old equipment and appliances.

To sum up . . . you can't cover the Gas Industry without

WESTERN GAS

A Monthly Publication of

WESTERN BUSINESS PAPERS, Inc.

124 W. 4th St., Los Angeles. Branches: Dallas, Texas; San Francisco

Circulations west of the Mississippi

WESTERN GAS	2068
Gas Age Record	619
Amer. Gas Journal	451

Standard Rate & Data Sept. 1, 1928

The COMPLETE Laundry Unit—Washer, Dryer, Ironer

To Sell More Gas!

YOUR business is to sell gas. Your problem is to sell more gas. And in order to do this **you must encourage the use and promote the sale of gas appliances for every domestic purpose.** You must advocate the economy, the convenience and the dependability of gas furnaces, home incinerators, gas refrigerators, gas fired washers, ironers, water heaters and a gas heated dryer. You must **convince** your subscribers that "if it's done with heat, you can do it better with gas." Consider

THE LAMNECK LAUNDRY DRYER

and what it means to the gas industry. It dries the clothes perfectly and quickly, on any day, in any weather. It "keeps the washing at home," underwriting the use of washer, water heater and ironer.

In an average home the Lamneck Dryer will directly increase the gas consumption 1200 cu. ft. per month—every month. And indirectly it will boost the load of all related appliances.

Every home is a prospect for the Lamneck Dryer. Numerous gas companies are aggressively merchandising this appliance—and they are selling dryers. They are making a substantial merchandising profit, but better still, they are building their gas load for years to come.

Write or wire us today and we'll send you prices, discount and terms.

THE W. E. LAMNECK COMPANY

443 DUBLIN AVE. COLUMBUS, OHIO

THERE IS NO NEED, WITHIN THE SPACE OCCUPIED BY THIS BRIEF COPY, TO SHOW A PICTURE OF A RADIANTFIRE HEATER.

¶ There is a Radiantfire that sells for $16.50 and there is one that sells for $250.00, and in between there are innumerable models at various prices. Although we believe that we have built into the Humphrey Radiantfire inherent quality that makes it a better fire at any price, there is one point on which every reputable and visioned organization interested in the advancement of the gas industry is in accord. That is, that it is not sufficient to sell $16.50 merchandise where the higher grade equipment should be installed.

PRIDE IN OWNERSHIP IS NOT BORN OF PRICE ALONE.

But it is inevitably associated with beauty of design, excellence of workmanship and the ultimate in utility, which can be built into only better grades of equipment.

A SMALL, CHEAP GAS APPLIANCE IN A HOME REPRESENTS AN INSECURE AND UNTRUSTWORTHY BULWARK AGAINST THE ENCROACHMENT OF COMPETING FUELS.

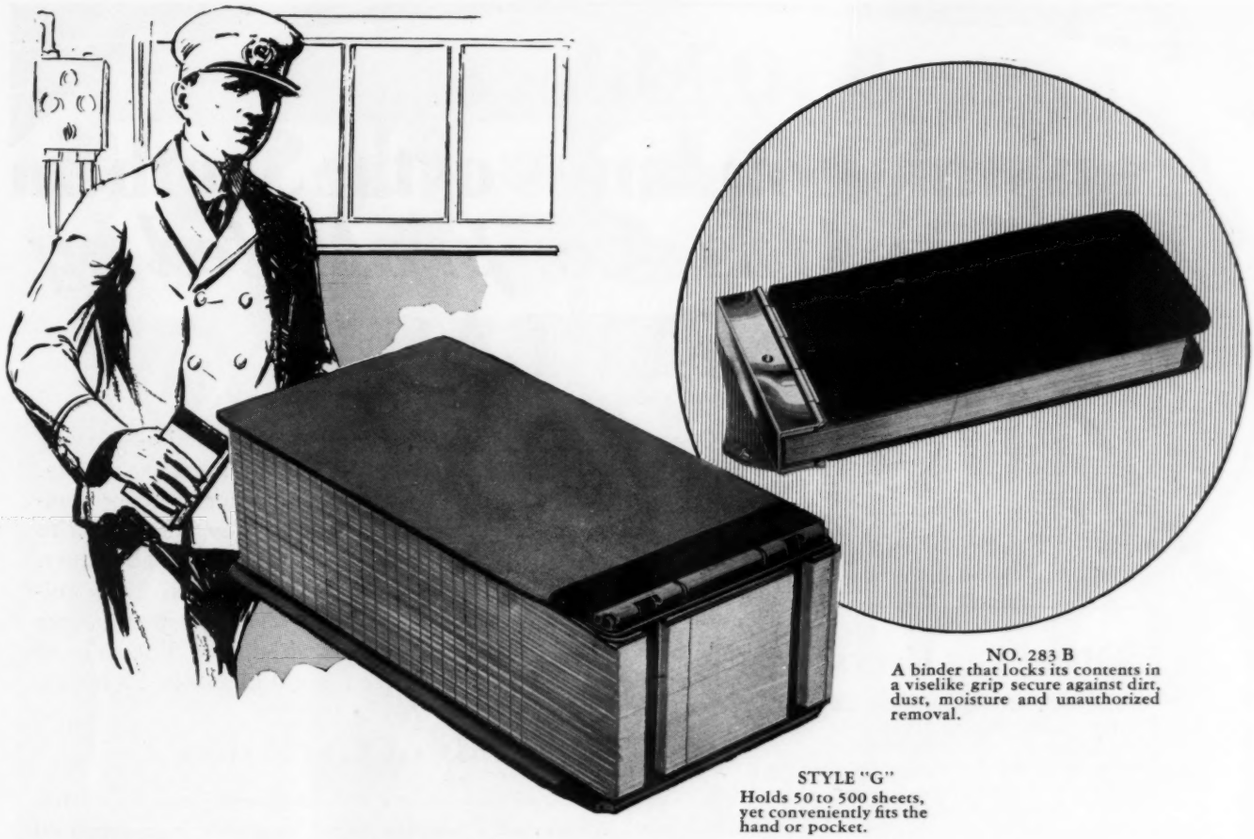
A fire that is an harmonious and carefully selected part of the home ensemble is a fire that will never be replaced, because it represents something much stronger than a mere utility; it represents the owner's pride of possession.

The HUMPHREY

Radiantfire

Manufactured by
General Gas Light Co.
Kalamazoo, Mich.

Pacific Coast Manager
C. B. Babcock
135 Bluxome St.
San Francisco



NO. 283 B
A binder that locks its contents in a viselike grip secure against dirt, dust, moisture and unauthorized removal.

STYLE "G"
Holds 50 to 500 sheets, yet conveniently fits the hand or pocket.

Meter Readers' Binders

. . . that protect your records

GIVE your meter readers' records the best protection possible . . . Baker Vawter-Kalamazoo Binders. Records prepared in damp, dark cellars, carried about all day in all kinds of weather by careless meter readers . . . is it any wonder they often reach the office too illegible to record?

Public utility companies are universally adopting these neat, compact, protecting binders for meter data. Made in several styles, compact enough to fit the pocket, yet holding 500 sheets, and others with positive lock protection, specially designed to meet specific problems. These binders will outwear use and weather. The entire contents or single sheets may be quickly removed, facilitating bookkeeping duties, yet their high compression binding eliminates any possible loss of data while in transit. Why run a chance of lost or illegible records? Your local Remington Rand man will demonstrate these binders at your convenience and without obligation. Phone him today.

Baker Vawter-Kalamazoo

Division

Remington Rand Business Service *Inc.,* Buffalo, N. Y.

Branch offices in all principal cities

550 Miles of Transmission Lines of the Southern California Gas Co. *protected by* McEVERLAST

One of the West's great public utility companies—serving millions—now using **McEverlast** protection almost exclusively. No guesswork here! Pipe protection is a matter of many thousands of dollars! Every product the company adopts has to run the gauntlet of biting tests—in the field and laboratory. **McEverlast** Protective coatings came through with flying colors! "Tests show remarkable results" was the report. Since then **McEverlast** Protection has been applied to 550 miles of transmission lines, varying in size from 8 inches to 16 inches.

Other Big Users

This big gas company is but one of a rapidly growing list of giant corporations now using McEverlast Protective Coatings. Among the present users, some of whom have standardized on McEverlast are:

Southern California Gas Company; Los Angeles Gas & Electric Company; Shell Company of California; Pan-American Petroleum Company; Sun Oil Company; Simms Oil Company; California Petroleum Company; General Petroleum Company; California Eastern Oil Company; Western Oil and Refining Company; Chanslor-Canfield Midway Company; Union Pacific Railway; Hercules Gasoline Company; Richfield Oil Co.; Industrial Fuel & Supply Co.; City of Los Angeles and twenty-nine other cities in the Southwest.

Stops All Kinds of Corrosion

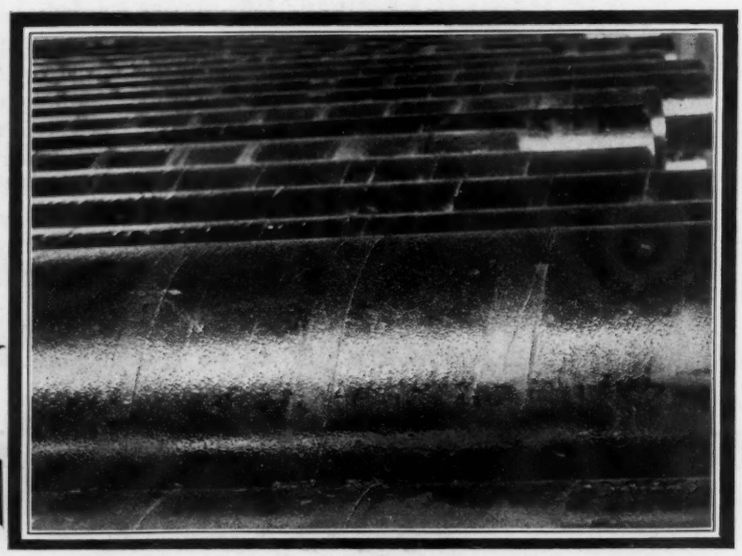
In the worst kind of soils—strong with alkali—favorable for electrolytic acton—**McEverlast** Protection fights corrosion to a standstill! Except in extreme cases, it is applied cold. This eliminates the risk of burns—cuts costs through speedier work! Write for our booklet "Safeguarding Pipe Lines with McEverlast Protective Coatings." Gives data on tests and other interesting information.

McEVERLAST, INC. [TM.REG.]

111 West Seventh St., Los Angeles, Calif.

1314 Magnolia Bldg.
Dallas, Texas

35 E. Wacker Drive
Chicago, Ill.

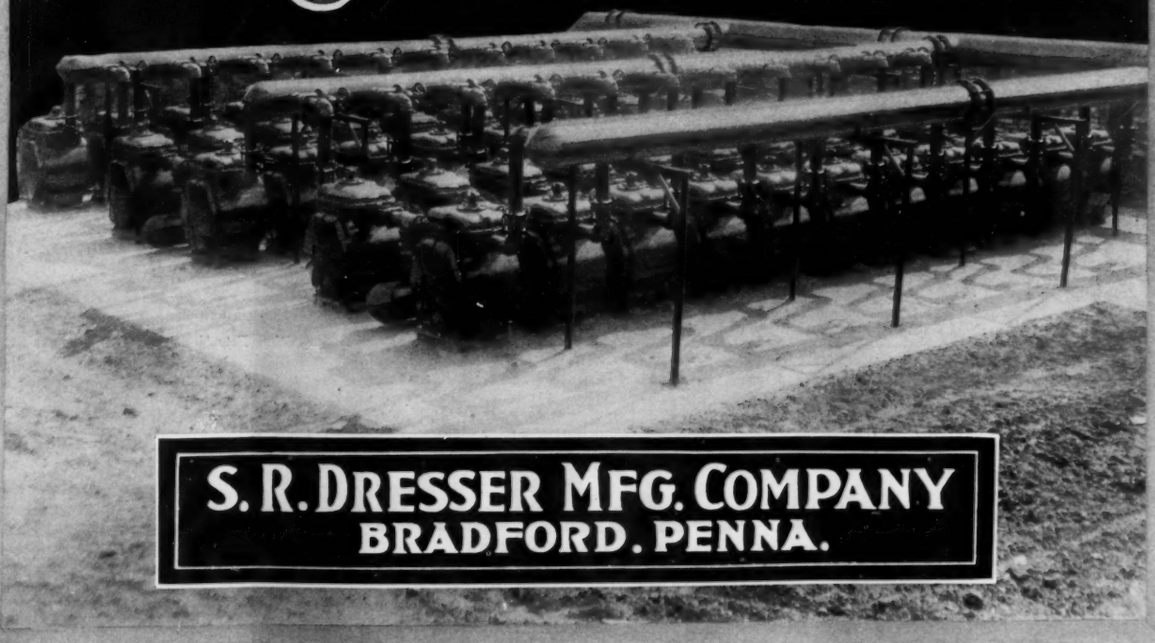


Close up of pipe just after receiving McEverlast Protection in the shops of the Crane Co., Los Angeles. Note the smooth, hard surface.

DRESSER

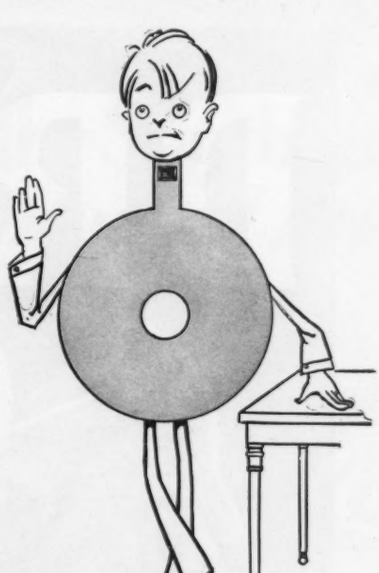
Couplings Dominate

They are Used Extensively for Meter and Service Connections.



S. R. DRESSER MFG. COMPANY
BRADFORD. PENNA.

THE HOLE TRUTH
and
nothing but the truth



A differential gauge may be 100% accurate in itself and yet fail to give truthful measurements if the orifice plate is wrong.

Our years of experience in building meters for the oil and gas industry enable us to make orifice plates that tell the truth.

Foxboro Orifice Plates are made of steel, stainless iron or monel metal. They are machined to microscopic exactness—1/20 of 1% of the diameter of the orifice is the limit of error allowed in manufacture. These limits will produce less than one tenth of one percent (0.1%) error in measurements for orifice diameters of ½ inch or larger. The orifices have uniformly sharp and square edges. Coefficients are extremely accurate.

Installing or changing orifice plates is easy with the patented Foxboro Flange Unions. Jack screws separate the flanges. The orifice plate is reversible and automatically centered. All flanges are tapped at the factory—it is impossible to install them incorrectly.

The accurate Foxboro Orifice Plate, together with the Foxboro Flow Meter, which has no inherent error, is the combination that assures you of accurate measurements of oil and gas. Write to the nearest Foxboro Branch for further information.

Foxboro Flange Unions and Orifice Plate. Foxboro Flanges are drilled and tapped at the factory.

Agents east of the Mississippi for Robinson Patented Orifice Flange Fittings.

THE FOXBORO COMPANY

Neponset Ave., Foxboro, Mass., U. S. A.

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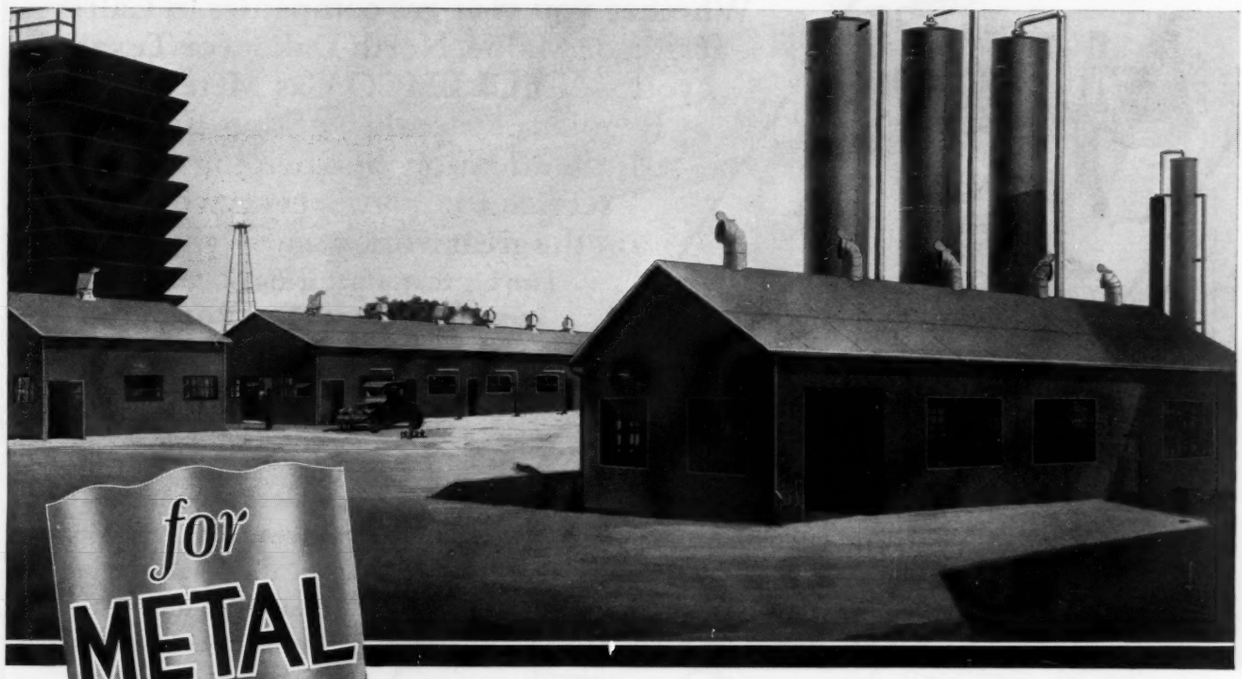
REG. U. S. PAT. OFF.

THE COMPASS OF INDUSTRY

DETROIT, BOSTON ATLANTA, TULSA CLEVELAND, DALLAS

Instruments for Controlling, Recording and Indicating Temperature, Flow, Humidity and Pressure

L&S PORTLAND CEMENT PAINT

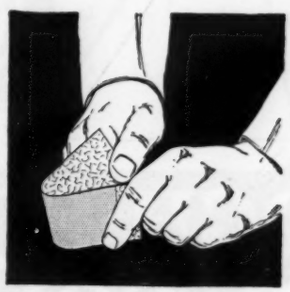


for METAL *Surfaces*

Covers completely in ONE coat

The unusual tenacity and hiding power of L & S Portland Cement Paint is attested to by the fact that ONE coat, in most cases, is sufficient to cover completely. The result is that the use of L & S Portland Cement Paint effects increased surface protection against Fire, Weather and Water, at one-half to one-third the cost per job of other cement-contained paints.

L & S Paint is recommended for all metal surfaces, without exception, as well as brick, concrete, stucco and even glazed tile. It greatly reduces fire hazards when applied to wood surfaces. The perfect bonding qualities of L & S Paint are illustrated by the test shown at left: L & S has been applied to ordinary galvanized sheet iron metal, untreated in any way. The sheet can be bent double until the galvanizing leaves the metal, but the L & S will still adhere firmly. Furnished in eleven attractive shades and black and white.



HILL, HUBBELL & COMPANY

Division

General Paint Corporation

Manufacturers of Highest Grade Oil Industry Paints and Pipe Line Coatings

General Offices: **SAN FRANCISCO**

Mid-Continent Factory: **TULSA**

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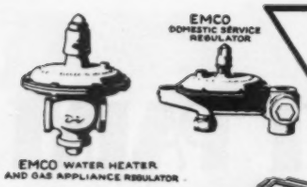

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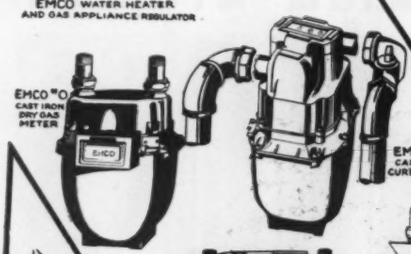

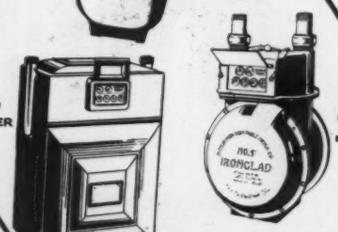

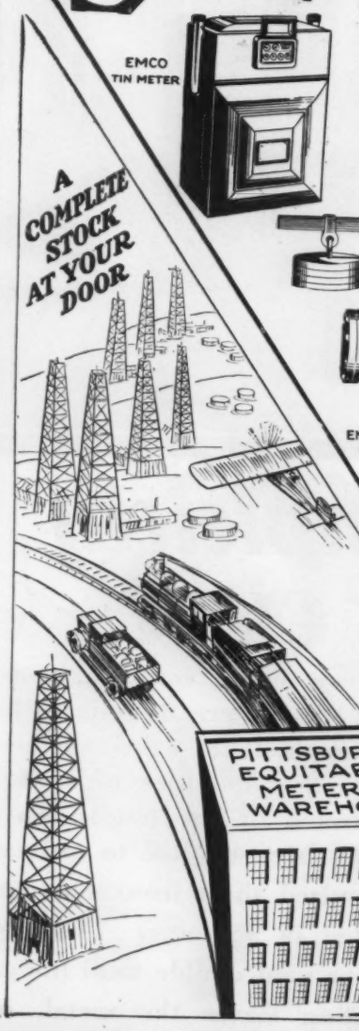

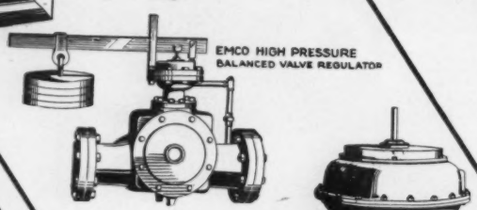

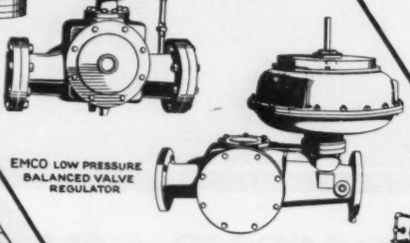

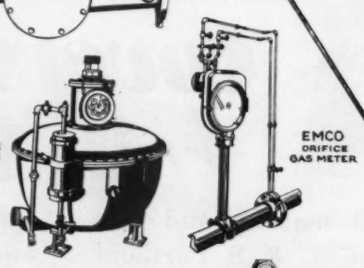

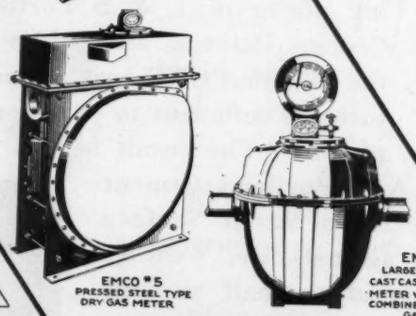

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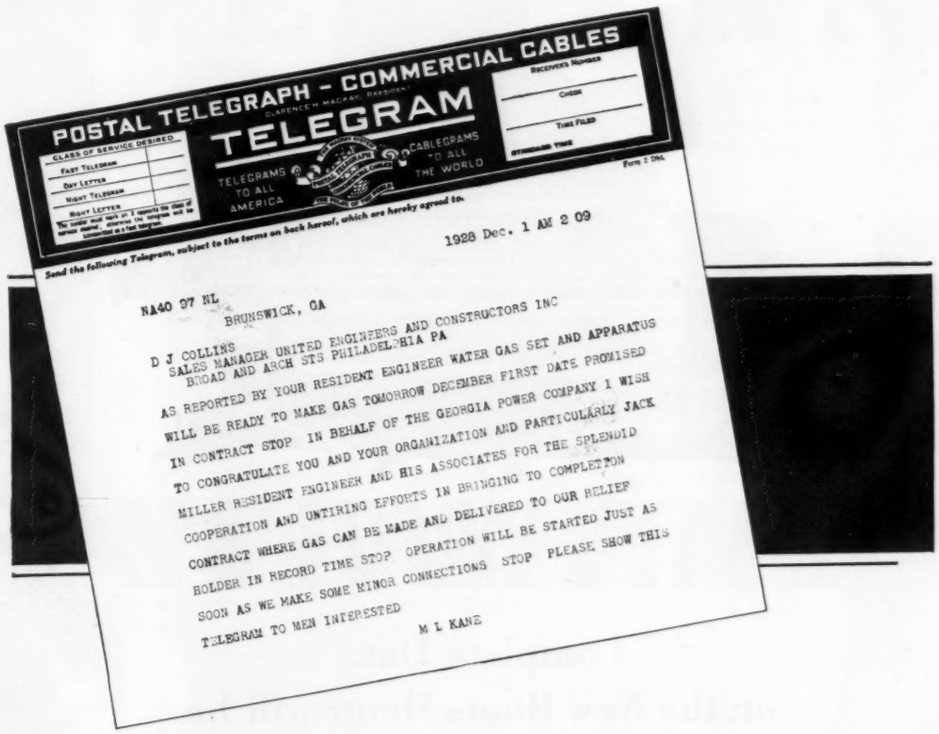

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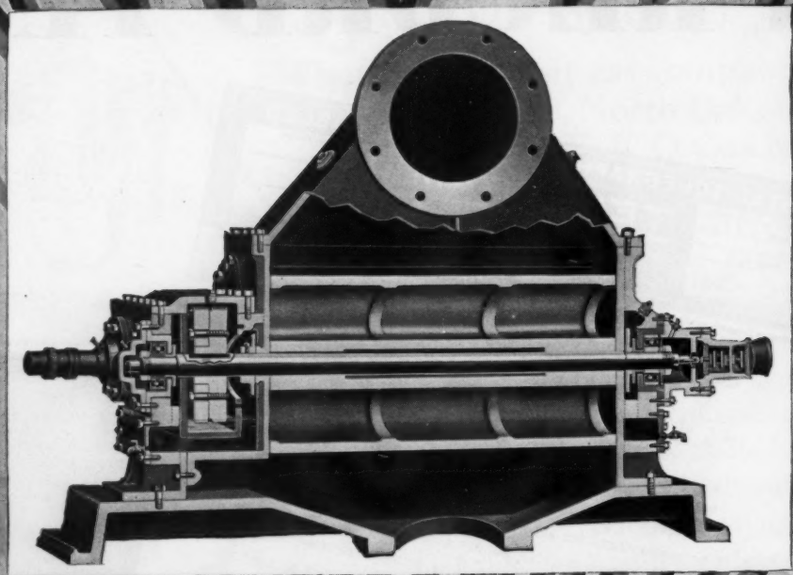

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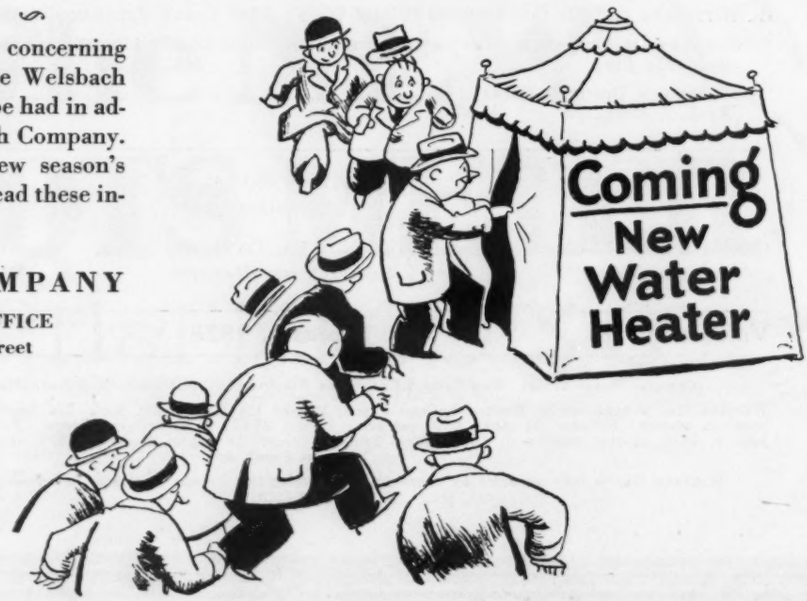

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PACIFIC COAST WELCOMES A. G. A. CONFERENCE

IT has been four years since the gas industry of the Pacific Coast has had opportunity to play host to the American Gas Association Advisory Council and Executive Board, now meeting in conference at Los Angeles on invitation of the Pacific Coast Gas Association.

Many of the eastern delegates to this present Conference came to San Francisco for a similar gathering in February of 1925. The western industry welcomes their return, and welcomes, too, those who come for the first time to participate in the Conference and briefly glimpse the attractions of the western coast. The message of cordial greeting given to the visitors by President C. H. Dickey at the opening session of the Los Angeles meetings expressed the sentiment of the whole western industry.

CHAS. H. DICKEY
President, Pacific Coast Gas Association

These periodic Pacific Coast meetings serve a highly useful purpose. President O. H. Fogg in his remarks of response to the welcome extended the A. G. A. delegation, spoke of the breaking down of all barriers within the national gas industry, commenting upon the influence of modern refinements in travel and communication in drawing distant sections more closely together. Meetings such as the one now in progress contribute to the same worthwhile end.

The present time is a particularly fitting one for American Gas Association leaders from other points to renew their acquaintance with the industry on the western coast. Changes have followed each other in rapid succession on the western side of the Rockies, and this is as noticeable among gas utilities as it is in general conditions. As population pushes westward from more crowded centers industry necessarily follows in its wake, and this process has placed new demands upon gas. This development will hold interest for visiting gas men. Pacific Coast men, for their part, will gain from the deliberations of the Conference an illuminating view of conditions affecting the gas industry elsewhere.

Preparations for the Los Angeles meetings have been laid with some care, and the program is representative of the broad industry rather than any single section. It is the hope of Pacific Coast gas men that the meeting will prove profitable, that its location will contribute to the pleasure of those in attendance, and that it will be but one of many similar conferences in the west.

A. G. A. Conference visitors to the Pacific Coast and the western delegation which met them as they detrained at San Bernardino, Calif., are shown in the view above, taken just before the party left for luncheon at the Riverside Mission Inn.

A. G. A. Advisory Council *and* Executive Board *in* Session *on* Pacific Coast

WHEN their west-bound train drew into San Bernardino, Calif., at 11:40 a.m. of Tuesday, February 6, eastern delegates to the American Gas Association Advisory Council and Executive Board session at Los Angeles were met by a group of western gas executives who hustled them away to the famous Mission Inn at Riverside, a few miles distant, for luncheon, and then conducted them on a tour through citrus growing sections en route to Los Angeles, where sessions of the conference are now in progress as *Western Gas* goes to press.

The A.G.A. heads are on the Pacific Coast for the first time since the 1925 conference at the Palace Hotel in San Francisco. Program and arrangements for the Los Angeles meeting were in the hands of a committee made up of F. S. Wade, president of the Southern Counties Gas Company, Los Angeles, chairman; Clifford Johnstone, executive secretary, Pacific Coast Gas Association; K. R. Boyes, secretary, American Gas Association; H. Leigh Whitelaw, American Gas Products Corporation; Addison B. Day, president, Los Angeles Gas and Electric Corporation; H. C. Abell, vice-president, Electric Bond and Share Company; S. W. Meals, president of the Carnegie Natural Gas Company, Pittsburgh, Pa., and chairman of the A.G.A. Natural Gas Department.

With 100 or more present the business sessions of the conference opened at 10:00 a.m., Wednesday, February 6, at the Hotel Biltmore, O. H. Fogg, president of the A.G.A., presiding. President Chas. H. Dickey of the Pacific Coast Gas Association, who on behalf of his organization had last October invited the conference to the Pacific Coast, and F. S. Wade, chairman of the committee on arrangements and proram, both gave brief expressions of welcome to the delegates, responded to by President Fogg.

A NATIONAL SYMPOSIUM

A symposium of views on present conditions and future possibilities in the industry throughout the nation participated in by six men from widely scattered points occupied the chief place on the morning program. E. L. Hall, general superintendent of the Portland Gas and Coke Co., opened this nation-wide survey. His remarks on electrical competition in the Northwest, and his recommendations for A.G.A. research in this field, were given interested attentiin. Following Mr. Hall, A. F. Hockenbeamer, president of the Pacific Gas anl Electric Company, reviewed outstanding aspects of the Pacific Southwest industry. The Middle West was represented in the address of W. A. Sauer, vice-president of the Peoples Gas Light & Coke Company, Chicago. Henry C. Morris, president of the Dallas Gas Company, dealt with conditions in the South, while the Atlantic Seaboard was covered by Floyd Parsons, editorial director for the *Gas Age-Record*. F. C. Freeman, vice-president of the Providence Gas Company, presented the New England outlook. Arthur Hewitt, general manager of the Consumers Gas Company of Toronto, was unable to be present to contribute the Canadian viewpoint as first planned.

Concluding the opening session was an address by Clyde H. Potter, chief commercial agent for the Southern Counties Gas Company, and chairman of the Pacific Coast Gas Association Commercial Section, on the subject: "Are Sales Conditions Different?" The meeting then adjourned for luncheon, held at the Biltmore in rooms adjoining those where business sessions took place.

The committee on local arrangements, made up of N. R. McKee, chairman, N. L. Morse, T. B. Parks, W. M. Thompson, and C. D. Weiss, arranged a theatre party with A.G.A. visitors as guests, at Grauman's Chinese Theatre

(Continued on Page 36)

Agencies *of* Progress

By ALEXANDER FORWARD
Managing Director, American Gas Association

THE strong spots in the gas industry are its stability, its adaptability, its high technical development, its unexcelled credit, and above all, its leadership and its co-operative spirit. Its weak spots are the lack of more efficient gas-burning industrial appliances and its partially developed salesmanship. The industry's needs inevitably come to the surface in our sectional and committee work, and their relative importance is finally passed upon by the Executive Board of the American Gas Association.

A voluntary organization such as the Association, if its existence and maintenance are justified, must be the industry's agent of progress. It is equally true that a headquarters organization, charged with the duty of collecting the facts, interpreting the needs and forecasting the trends of an industry, cannot execute the operations of progressive agencies without full co-operation and counsel of the membership. Such co-operation is given to the full by the members of this Association. Our job is to do for the industry what no one company can do so effectively for itself, and to do this we have, to a degree I believe unsurpassed in any field, the "everlasting teamwork of every blooming soul."

I must be brief and can only touch the high spots.

FACT-GATHERING

We have indeed a wide field for fact-gathering, aside from obvious facts which anyone may know but which not everyone uses for comparative purposes.

The city of Chicago consumes more gas than the combined consumption of Italy, Holland, Switzerland, Norway, Sweden and Czechoslovakia. Baltimore's output excels Switzerland, Sweden and Norway together. Portland's equals Sweden's. New York sells more gas in an average quarter than all of Italy in a year. The sales of gas, manufactured and natural in the State of California is in excess of the total for Continental Europe and is nearly 80 per cent of England and Wales.

Treating as a mere truism the fact that every executive knows no business can make progress unless it has at its disposal a complete stock of detailed information, we can say this basic need is undergoing rapid development in the Statistical Bureau at Headquarters.

AMERICAN Gas Association activity is continually expandng to encompass the industry's new needs. This is the keynote of Major Alexander Forward's address before visitors and members of the A. G. A. Advisory Council and Executive Board, gathered in conference at Los Angeles on the invitation of the Pacific Coast Gas Association.

Alexander Forward

Managing Director Forward delivered his message at the Wednesday afternoon session, February 6, reviewing a number of the "agencies of progress" functioning so efficiently for the industry's advancement under A. G. A. administration. Space limitation prevents publication of the address in full. One fact apparent in portions of the address appearing below is that A. G. A. research enterprise can prove as helpful in the field of sales economics as in that of engineering science.—*Editor.*

The success of any business must be judged ultimately by effective utilization of invested capital. The factors here illustrated are of great import for gas utilities, for there is scarcely any type of business which approaches ours in the volume of capital required for the business done and the turnover realized. It takes $5 investment in the gas business to earn $1.00 gross and 19 cents net, so any development which tends to more effective utilization of capital necessarily results in greater security and wider service.

Without question, the outstanding development in American Gas Association activity the past two years has been in the direction of research for the ascertainment of facts. This is not only as it should be but as it must be. From all quarters within the industry has come this insistent demand. It has been well said that research in our day is no longer a luxury—it is a necessity of civilization. It is significant that those industries which are spending the largest amounts of money and brains in research are the most successful, while those which are standing still or going backward are those which are paying the least attention to the problems of their service to the public of the future.

One cannot drop a dollar in the research slot and have five or a hundred or a thousand dollars returned. But when we can show such tangible results—nothing is more certain than that the gas industry's investment in research today is but a fraction of what it will so invested five or ten years hence.

SERVICE AND SAFETY

As of January 1, 1929, the Gas Appliance Testing Laboratory in Cleveland, established and operated by the American Gas Association for the purpose of promoting better and safer domestic gas burning appliances, had approved by test and inspection 9,918 gas ranges, 920 space heaters, 316 water heaters, 575 central house heating appliances and is preparing requirements for testing hot plates and laundry stoves. It is now difficult to sell any domestic gas burning appliance which does not bear the Laboratory seal of approval. The Laboratory has established for itself the highest standing for impartiality and efficient operation and we feel, we trust with due modesty, that the Association deserves the judgment pronounced from important sources that this institution, adequately housed and equipped by the industry, and enjoying the full co-operation of our manufacturers and of governmental bureaus, is the outstanding example in American industry of self-regulation in the public interest.

GAS MIXING

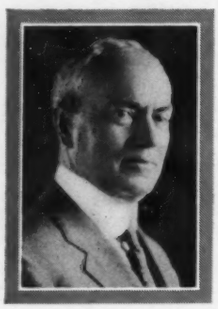
A section of the pamphlet "Research Discussions" is given to a statement of the research in mixed gases conducted at the Cleveland Laboratory under the direction of a committee of the Technical Section connected with that Section's Committee on Engineering and Economic Survey of the Gas Industry. Brought down to date, this work has developed more than a thousand pages of typewritten data and discussion, covering more than 67,000 separate tests.

(*Continued on Page 48*)

Research Must Keep Pace

¶ *Excerpts from an Address on "The Research Program of the Gas Industry" Delivered at Los Angeles, Calif., on February 6, 1928, Before the Pacific Coast Conference of the American Gas Association Advisory Council and Executive Board.*

By H. C. ABELL



H. C. ABELL
Chairman, Committee on Coordination of Scientific and Marketing Research of the American Gas Association.
Vice-President, The Electric Bond & Share Company, New York, N. Y.

THE gas industry cannot remain stationary. It must either retrograde or advance when in competition with other sources of heat agencies. To advance it must initiate more economical methods of producing gas, as well as transmitting and distributing it, and must obtain uses for many hours in the year and methods of use during the hours of the present light consumption.

The problem of the maximum use of the investment is a large factor in cost because of a fair rate of return, renewals and replacements, and taxes are based on investment; consequently the appliances and apparatus for utilization must be developed most efficiently and in the greatest number to take on the greatest diversified business to improve the use of the present financial outlay.

COMPETITIVE FUELS

The competition which the gas industry has from coal, oil and its by-products, electricity and other agencies is a problem which must be met both now and in the future. This problem is a part of the study and program of the Committee on Economic and Engineering Survey.

In the domestic and residential uses, outside of house heating, the matter of convenience, entailing no handling of waste products, ashes, etc., health, time of actual application of heat to obtain the desired result, the readiness with which the gas is obtained, etc., places the use of gas in the desired class. Electricity is a competitor in this regard, but I believe it is seriously handicapped in competition with gas for the above purpose due to its cost.

The electrical investment per million B.t.u.'s delivered at the consumer's premises is about twice or over that of gas and the thermal efficiency from the fuel is about one-third or less than gas. The transmission of heat by means of gas compares most favorably with the transmission of electricity.

The higher efficiency of electrical appliances cannot overcome this handicap. We must, however, not lose sight of the fact that the electrical industry is always most diligently at work on research problems, and has and is greatly improving the cost of its service to the ultimate customer, including reductions in the former costs of the appliances, reducing the time of application to accomplish a desired result, improving the thermal efficiency of generation, decreasing its investment per unit of demand and increasing its use through interconnection, etc. Any improvement in the load factor which might be common to gas and electricity still places gas on the same relative competitive basis, but as the output cost of gas per million B.t.u's is less than can be obtained electrically, gas would still have that advantage, unless the gas industry, through its delay in research development, permits the electric industry to obtain increasing advantages. The gas industry must contrive to keep pace with the electrical development on a competitive basis, both in regard to higher efficiency apparatus and appliances at the lowest relative cost, and in the creation of new devices and uses.

The average residential business yields a yearly load factor of from 25 to 30 per cent based on the maximum hourly demand, and about 40 to 70 per cent based on the maximum day's output.

INCREASED USE OF INVESTMENT

Assume a company is receiving $1.20 per M.c.f. for gas and that the actual output cost is 30 cents per M.c.f., that the load factor is 50 per cent, and that the present density of sales permit the company to earn a fair rate of return in addition to all other expenses in accordance with public regulation. The total cost represented by the 90 cents received in addition to the output cost of 30 cents per M.c.f. will not increase in total dollars to a great extent by bettering the load factors; therefore if the load factor were doubled, this expanse would be approximately half of its present cost per M.c.f.

Assuming, for illustrative purposes, that the company could sell gas on a 100 per cent load factor basis instead of 50 per cent and that the output cost remained approximately the same, 30 cents per M, then the price it would receive for gas would be only 75c per M, to obtain the same relative revenue above actual output cost of gas. The fixed part of the cost of gas would only be approximately 45 cents per M.c.f. instead of 90 cents.

If the load factor were increased to 75 per cent and the total cost represented by the 90 cents per M.c.f. of the $1.20 over the output cost of 30 cents by M.c.f., then the fixed portion would be 60 cents, or the average sale price 90 cents, instead of $1.20 per M.c.f.

These figures are merely presented to indicate how necessary it is to increase the use of the investment more hours per year without increasing maximum demands to a point requiring more investment and, therefore, greater cost. To increase the load factor will put any public utility on a much better basis to compete for the higher priced and more profitable business.

RELATIVE FUEL COSTS

While presenting this paper, I believe I should proceed a little further and attempt to present an example which will show the cost of other fuels compared to gas and which proves to me, at least, that every branch of the gas industry must undertake its specific research problem in order to obtain the maximum development.

The average calorific value of manufactured gas distributed by gas public utilities is approximately 550,000 B.t.u. per M.c.f. Assume the output cost of gas to be 30 cents per M.c.f.; that competitive coal would cost $4.00 per net ton and a calorific value of 13,000 B.t.u's. per pound; oil at $1.50 per barrel of 42 gallons and 5,600,000 B.t.u.'s per barrel; electricity at ½ cent per KWH

(*Continued on Page 60*)

Industrial Gas Sales Development

What Rates Will Get the Business?

By H. C. MEADE
New Orleans Public Service, Inc.
New Orleans, Louisiana

AT this time, when a number of major western cities, as well as many smaller ones, are on the eve of introducing natural gas in place of manufactured, this paper presented before the Southwest Division of the A.G.A. Natural Gas Department at Shreveport early in January has a strong timely appeal. New Orleans Public Service, Inc., with which the author is associated, has itself only recently entered upon natural gas service.

Mr. Meade lays down the rudiments of industrial gas sales as the bulwark of natural gas marketing, and gives large place to the importance of setting up the proper rate structure at the outset.—*Editor.*

IN THE marketing of natural gas, along with the development of the domestic and commercial business, it is essential that the industrial field be cultivated to the fullest possible extent, especially so when the gas has to be transported for a long distance to reach its market. Industry is the long hour user and makes for good load factor, which is necessary for the financial success of any pipe line project or distribution system.

It is not the purpose of this paper to lay down any formula or set of rules for developing this industrial field but rather to discuss certain fundamentals that have been tried and found sound.

When natural gas is about to be introduced into any large community it usually finds a territory with domestic and commercial business quite highly developed on a manufactured gas basis. The problem is therefore to maintain as much as possible of the business already developed in the commercial field and to develop all additional business, both commercial and industrial, made possible and necessary by the advent of natural gas. In smaller communities, where manufactured gas has never been distributed, the problem, in essence, is the same; it is equally necessary to attach all the business from the poorer load factor, higher cost, classes of usage while simultaneously building up the load factor by attaching the maximum possible amount of industrial business.

The first difficult problem which a distributing public utility will encounter in the change from the sales of manufactured gas to the sales of natural gas is one of a greatly increased calorific value of natural gas over the manufactured gas, and the constant demand for a lower price per thousand cubic feet for natural gas. Nobody apparently appreciates that the gas company is selling heat units which unfortunately cannot be measured directly but are measured by the number of cubic feet registered, which consequently must be multiplied by the heat units contained per cubic foot. This is by far the most difficult problem which an existing manufactured gas distributing system encounters in changing from manufactured gas to the distribution of natural gas. The change is probably never considered from an economic viewpoint, and history has shown that in almost every instance the distributing company is compelled to lose a great deal of money following the introduction of natural gas, and until it can either develop sufficient good load factor business at fair rates to compensate for the loss of the domestic utilization or else adjust the rates upwards after a fair trial.

The next question is, therefore—what prospective business is in sight?—the third, what revenue does it offer—what rates will get the business?—and the fourth question, what will it cost to serve it?

The answer to the second question, what business is available, is developed by a thorough and complete survey. In making a survey, in order to avoid possible omissions, it is convenient to divide a given territory into districts and to assign to each district a number such as is used in the decimal filing system. Then in district designated as 100-200, the first industry surveyed would be 100, the second 101, and so on, while in district designated as 200-300, the first industry surveyed would be 200, the second 201, and so on. Some such system greatly simplifies the location of prospects on a map and readily lends itself to checking and geographical filing. Further means of identification can be added for allocation into typical classes, and for building load data necessary in laying out mains or extensions to distribution systems.

The individual survey sheet for each prospective industral or commercial consumer should contain name, address, graphical sketch of location showing bounding streets, alleys, etc.; type of ndustry, name of correct party to see, (this is important, as much time can be wasted in selling the wrong man), a record of fuel used by years to indicate growth, and by months for the last year, the maximum rate of use, both hourly and daily and when occurring, a description of the fuel-using equipment, cost and kind of fuel, storage capacity, average fuel stock carried, handling charges of present fuel such as labor, power and maintenance of equipment. A full description of prospect's method of operation should be obtained, giving number of hours per day, days per week, and months per year with seasonal load fluctuations. The back of the survey sheet can be used for remarks and can carry a complete contact record and history of operation.

With the survey completed we have the means of answering our second question, what business is available? Inasmuch as a territory of considerable size offers a varied number of industrial prospects differing widely as to load characteristics and prices paid for fuels, it is necessary to segregate them into typical classes. It is not posible to set down hard and fast rules for classification that will apply in all territories, but since our first problem is to find what business is available a segregation into classes of business such as ice manufacturers, alcohol distilleries, industrial bakers, building heating, etc., is logical. A further classification according to features of competitive fuels is helpful, such as type of oil delivery, whether tank wagon, tank car, barge or tank ship. The purpose of the segregation is to get a clearer picture and make possible closer study to

determine load characteristics and the possible revenue.

A tabulation made from survey sheets for each class of industry showing the name and type of industry, present fuel usage and equivalent gas for each of the twelve months, total for the year, dollars paid for present fuel, and average competitive rate per M.c.f. for gas, presents a cross-section of the value of the service to the prospect.

In determining the amount of gas equivalent to the other fuel used, it is helpful to study in detail one or more of the most efficiently operated industries of each class. A flue gas analysis, with stack temperature, and notes made on the job are helpful in determining how efficiently the fuel is used. In the sale of gas for industrial purposes the leading factor is fuel economy, and it is important to realize that the relative value of gas as compared to coal or oil is not found entirely in a B.t.u. comparison. In the case of oil there are many other factors that must be taken into consideration in addition to the B.t.u. content per bbl. of oil, such as per cent of water per bbl., losses in evaporation, B.S., and spillage, greater amount of excess air, higher stack temperature, use of steam or power for atomization, unburned carbon, steam for oil heating and power for pumping, higher maintenance on furnace walls, tubes and stack. The theoretical thermal equivalent of one barrel of oil is about 6300 cubic feet of natural gas, and in the most efficiently operated large boiler installations this theoretical figure is attained in practice. However, in smaller and less efficiently operated boiler installations, and in many process applications it is possible to burn gas more efficiently than oil, and therefore for the general run of industries the volume of gas required to do the same work as one bbl. of oil is less than the theoretical 6300 cubic feet. However, for purposes of the industrial analysis the industry of each class which uses present fuel most efficiently should be selected. If the gas rate is designed so as to be competitive with other available fuels for these key industries, it will be better than competitive with the others.

The tabulation showing the value of the service to the prospective consumer sets the upper limit of the rate. Using ordinary graph paper with the abscissa or base denoting per cent load factor and the ordinate denoting cents per M.c.f., the competitive price per M.c.f. for each of the typical classes can be plotted against the average load factor of each class. Individual industries can be plotted if desirable, using a color scheme to identify the various classes. A curve drawn through these points gives a graphical picture of the value of service to the prospective business. The next step in the study is to find the cost of the service, and this is just as important as knowing the value of the service, since for some classes of business the cost exceeds the value. Therefore, our fourth question, what will it cost to serve the business?

From our survey sheets we can extend the taublation showing the average competitive price per M.c.f. for those prospects, so that it will include the load characteristics of each industry, the number of prospects and the load characteristics of each group of industries, including total group consumption and total group maximum hourly and daily demands after having made proper allowance for diversity between individual industries. This provides the essentials for estimating the cost to serve, when unit costs are known.

To connect the average consumer to a gas supply, money must be invested by the company in pipe line, distributing system, services, meters, governors, etc., and since our capital is turned over only once in four or five years, the capital or investment costs are most important. It makes no difference whether the pipe line or distribution system was built for the particular consumer or project, the fact that there is capacity to handle the particular load means that money has been spent. The money spent was invested in physical equipment, and there is therefore a consequent annual, fixed, expense to be paid. This fixed cost consists of taxes, retirement reserve, and the cost of money or fair return on the invested capital. In addition to the fixed or investment costs there are the out-of-pocket operating expenses necessary to make the investment function and deliver the commodity how, when and where needed, and finally the cost of the commodity itself. Due to the fact that manufactured gas has not as yet been developed to take on the maximum gas business in competition with other fuels, the investment turnover is as stated. One can readily see the very great importance of adding business which will greatly increase the use of the investment and thereby increase the rapidity of the turnover from once in four or five years to once in three or less.

To equitably apportion these costs between consumers it is necessary to separate them into cost factors, which cost factors are brought into being by the characteristics of the service demanded by consumer. These costs fall logically into three divisions, namely: demand costs, customer costs, and commodity costs. Much has been written concerning these cost factors and detailed instructions published as how to allocate them so they will only be mentioned here for purposes of review.

1. Demand Cost

The demand cost includes that portion of the fixed costs which are attributed to the proportion of the total investment necessary to meet the maximum hourly and daily demands placed upon the property. It consists of that part of the company's expense necessary to provide and maintain a production, transmission and distribution system of sufficient capacity to render the kind of service demanded by the consumer. This cost is in proportion to the total of all the customers demands and therefore should be apportioned between customers in the ratio that each contributes to the total.

2. Customer Cost

The customer cost includes the fixed costs on that part of the investment whose magnitude is in direct proportion to the number of customers served, such as the value of meters, services, a portion of the mains, etc. It also includes the cost of meter reading, billing and collecting, keeping customers accounts, free complaint service, setting, removing, changing, testing and repairing meters and all those costs of like nature caused by customers needs, and which vary with the number of customers served.

3. Commodity Cost

The commodity cost includes those costs which are measured by the amount of commodity (natural gas) handled and which vary directly with the extent of use of the commodity.

After these three cost factors have been allocated in total, then average unit costs are found by dividing by the number of units. The total demand cost is divided by the demand on the system, the total customer cost is divided by the number of customers, and the total commodity cost is divided by the total commodity handled. In the case of the unit customer cost, it must be remembered that the cost found as above is the average customer cost and for certain large customers the customer cost may be considerably higher than the average due to a larger investment and greater service cost of reading meters weekly, etc.

The application of these unit costs to the load characteristics of the typical classes of business, as set out in the survey tabulation clearly determines the cost to serve. Knowing what the service is worth to the prospect and what the cost to the company is, intelligent rates can be designed. While the prospective business was grouped in classes for ease in studying, it does not follow that it will be necessary to design class rates. It may be possible so to proportion the demand charge and the first blocks of the commodity charge that one industrial rate will fit all classes of profitable

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Gas Serves *the* Metal Worker

Typical Applications *of* Gas *to* Heat Treating

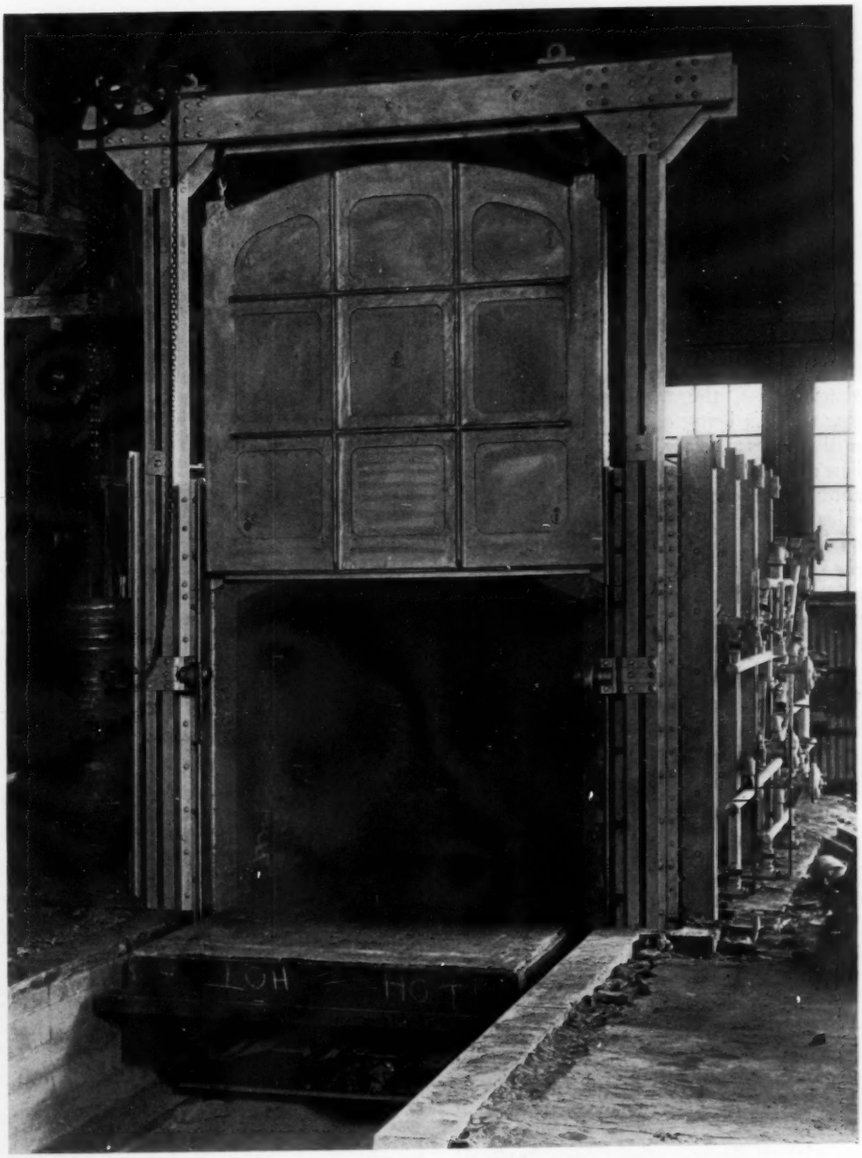
By E. M. DEREMER
Southern California Gas Company

DURING the sessions of the Western Metal Congress, held in Los Angeles, January 14-18, under the auspices of the American Society for Steel Treating, a morning program was occupied by the Pacific Coast Gas Association. C. M. Grow, new business manager of the Southern California Gas Company, arranged the program on behalf of the P. C. G. A. Commercial Section, and presided over the meeting which was held at the Biltmore Hotel on the morning of January 17, attended by a hundred or more gas engineers, industrial plant executives, and others interested in the application of gas to industry's needs.

E. M. DeRemer of the Southern California Gas Company read a paper describing a number of different gas heat treating installations which had come under his observation in various parts of the United States, extracts from the paper appearing on this page.

Appended to Mr. DeRemer's paper is an industrial data sheet, with diagram of a car bottom annealing furnace. This material is selected from a booklet, "Modern Industrial Furnaces," prepared and published by the Southern California Gas Company for distribution at the Metal Congress and for subsequent use in industrial saleswork.

—*Editor.*



Car bottom annealing furnace installed on lines of Southern California Gas Company.

Car Bottom Furnace Used in the Annealing of Cast Steel and Its Alloys

Characterizing this application of gas the following details may be briefly stated:

The top of the car is level with the floor of the foundry to facilitate loading and unloading. The hearth working area is 6 ft. by 8 ft. and the dimension to the spring of the arch is 6 ft. The construction is steel case, 4½-in. insulation and 9-in. first quality firebrick with cast iron and alloy steel used where necessary to insure long furnace life.

Proper mixture of gas and air is maintained by automatic inspirators. Air is supplied by a turbine operating at one pound pressure.

The temperature range is from 1200° to 2150° F., and is maintained by automatic controllers and a 3-in. valve.

Work to be heated is placed on the car and the whole shoved into the furnace. Sand seals automatically exclude air infiltration and also serve to protect the car from the intense heat. The door is lowered and clamped into place, and the charge is raised to the desired temperature on a pre-arranged schedule. Then the charge is allowed to soak and cool down slowly, or is quenched, depending on the alloy.

The furnace is entirely automatic in its operation and gives the management an exact record of what is going on inside at each stage.

Continuous Type Forging Furnace for Crank Shafts and Other Heavy Work

One of the oldest, most widely used and fundamental of all metallurgical operations, that of forging, is also the least advanced of shop processes. A survey of the forging field and an analysis of undesirable features bring to light that there are three main considerations that a modern forge design must provide, i. e.—high production, long soaking period and non-oxidizing atmosphere.

With the use of gas and automatic proportioning inspirators, a slightly re-

(*Continued on Page 46*)

PACIFIC COAST GAS ASSOCIATION

447 Sutter Street, San Francisco, California

A Department Conducted by Clifford Johnstone, Executive Secretary

The Task Which Faces the Commercial Section

RESPONSIBILITY is resting heavily on the shoulders of the commercial men in these days of intense competition and rapidly changing conditions. Gas, the most perfect fuel of them all, is being squeezed between the mill stones; below, the thrust of the baser fuels such as oil and coal, and above, the burden of the magnificent sales program of the electrical industry; on the one side, poorer fuels whose very cheapness makes them dangerous competitors, and on the other, a more expensive fuel being put over by sheer salesmanship.

It's a tough place for old Rip-Van-Winkle Gas Industry and it is the sales force which must pull him out.

Nothing new can be said about the need for sales activity. Every conceivable phase of it has been discussed ad nauseam at conventions and company sales conferences. Action is needed and it is the task of the Commercial Section to initiate action.

The barriers are many and high. First, there is the inertia within the industry; the accumulated tradition of a hundred years of semi-monopoly which recognizes no competition. Second, the apathy toward gas in many joint companies whose electrically-minded executives stifle the activity of the gas men and make them hasten to apply for transfer to electric sales where flows all the cream. Third, the pernicious philosophy which differentiates gas sales from gas appliance sales, and disclaims all responsibility for the character and installation of the only means by which gas can be used. Fourth,—but why go on? There is a dearth of leadership, insufficient research, a hesitancy toward cooperative effort, and a lack of competitive rate schedules, all of which have had their subtle influence on the mind of the public and their reaction on gas sales.

Where these faults exist, and some of them are true in every company, their correction must be the responsibility of the men on the firing line—the sales force. Theirs must be the acuteness to recognize and foresee, the intelligence to remedy and the courage to argue with the boss.

No more potent tool is available for this battle than the Association's Commercial Section. It is the ammunition train accompanying the guns. Every problem has been solved somewhere and a demonstrated mistake in one bailiwick need not be repeated in another. The competitive situation in Washington of yesterday is the situaton in San Francisco today and will occur in Los Angeles tomorrow. The Commercial Section can and should advertise solutions, demonstrate errors, and analyze competitive trends. These things are possible to the group but impossible to the individual.

Give the Commercial boys a hand—they have a big job!

First Aid Contest to Be Discontinued

THE inter-company First Aid Contest which has been such an interesting feature of our last two conventions, will not be on the program at Del Monte. The purpose of these contests was to awaken interest in first aid and safety work, and the officers of the Association feel that this purpose has been accomplished and the time occupied by the contest should now be devoted to other activities.

The State first-aid meet, conducted by the Societies of Safety Engineers, has grown into an annual event in which gas companies now participate, making the convention contest a duplication. An arrangement has been made whereby the F. J. Schafer Trophy and the Society of Safety Engineers cup will be placed in competition at the State Contest and awarded to the gas company team receiving the fewest discounts. The cash prizes of ten dollars to each member of the winning gas company team and five dollars to each member of the second team will also be continued. These trophies are now in the possession of the Gas Works first-aid team of the Los Angeles Gas & Electric Corporation.

New Members

Members will be delighted to know that the Association has been strengthened and its field of usefulness increased by the fact that the Seattle Lighting Company has joined in its work as a company member. Fred K. Lane, general manager, will represent his company in Association matters.

Recent new Class B members include the California Servel, Inc., distributors of Electrolux gas-fired refrigerators, represented by its president, A. L. Spring of Los Angeles, and the National Tube Company of Pittsburgh, Pennsylvania, manufacturer of steel pipe and fittings, represented by Forrest G. Harmon, field service engineer, with offices in the Russ Building, San Francisco.

Committees on Gas Plant Safety, Refractories

Through an error the Committee on Refractories, as announced in January *Western Gas,* was confused with the Committee on Gas Plant Housekeeping and Safety. Correctly stated, these committees are as follows:

Refractories

T. N. Kellett, Chairman, Los Angeles Gas and Electric Corp.
L. A. Fulton, Vice Chairman, Pacific Gas & Electric Co., Oakland.
Guy Barker, Johns-Manville, Inc.
F. S. Bitgood, J. T. Thorpe & Son
T. S. Curtis, Vitrefrax Corporation
J. L. Donnelly, Pacific Clay Products Co.
J. A. Harritt, San Diego Consolidated Gas and Electric Co.
Tom Jenkins, Pacific Gas and Electric Co., Stockton
J. A. Johnson, J-N-J Firebrick Construction Co.
D. J. McCarthy, Pacific Gas & Electric Co., San Francisco
Andrew Perry, Pacific Gas and Electric Co., Oakland
A. M. Riesen, Pacific Gas and Electric Co., San Jose
J. F. Sauer, Pacific Gas & Electric Co., Marysville
V. R. Sullivan, Stockton Firebrick Co.
A. G. Suydam, Harbison Walker Refractories Co.

Gas Plant Housekeeping and Safety

A. E. Englebright, Chairman, Pacific Gas and Electric Co., San Rafael
W. A. Bahr, Pacific Gas and Electric Co., Sacramento
J. J. Breslin, Pacific Gas and Electric Co., San Mateo
M. J. Cereghino, Los Angeles Gas and Electric Corp.
Walter Cohick, Pacific Gas and Electric Co., Oakland
A. F. Derrick, Pacific Gas and Electric Co., Oakland
O. L. Dickinson, Pacific Gas and Electric Co., Fresno
V. R. Hughes, Pacific Gas and Electric Co., General Office
D. J. McCarthy, Pacific Gas & Electric Co., San Francisco
W. R. McDonald, Pacific Gas and Electric Co., San Francisco
A. M. Riesen, Pacific Gas and Electric Co., San Jose
W. E. Richmond, San Diego Consolidated Gas & Electric Co.
J. A. Riggs, Modesto Gas Company
H. J. Smith, Pacific Gas & Electric Co., General Office
T. W. Snell, Pacific Gas & Electric Co., Salinas
J. T. Sullivan, Sierra Pacific Power Co.

Committee Additions

Technical Section Executive Committee: S. R. Hutchinson of the Seattle Lighting Company has been added to this committee.

Technical Section, Production Sub-Committees.

Sub-Committee Personnel for Distribution Work

W. M. HENDERSON

Chairman Distribution Committee, Technical Section

Pipe Protection

Dozier Finley, Chairman, Paraffine Companies, Inc
Fred Benson, Los Angeles Gas and Electric Corp.
E. P. Bly, Standard Oil Company.
R. S. Fuller, Pacific Gas and Electric Company.
S. H. Graf, Oregon Agricultural College.
M. E. White, San Diego Consolidated Gas and Electric Co.
B. G. Williams, Southern California Gas Company.
B. A. Williamson, Los Angeles Gas and Electric Corp.

Load Factors

W. F. Pape, Chairman, Pacific Gas and Electric Co., Oakland.
W. A. Bahr, Pacific Gas and Electric Co., Sacramento
E. G. Campbell, Pacific Gas and Electric Co., San Francisco.
A. E. Englebright, Pacific Gas and Electric So., San Rafael.
Otto Goldkamp, San Diego Consolidated Gas and Electric Co.
N. L. Hoff, Los Angeles Gas and Electric Corp.
D. B. Larson, Portland Gas and Coke Company.
W. H. MacLean, Pacific Gas and Electric Company, San Jose.
J. F. Sauer, Pacific Gas and Electric Co., Marysville.
S. C. Singer, Southern California Gas Company.

Meters

R. M. Stewart, Chairman, Pacific Gas and Electric Co., General Office.
Frank Britton, Pacific Gas and Electric Co., Oakland.
F. H. Coble, Southern California Gas Company.
H. M. Crawford, Los Angeles Gas and Electric Corp.
D. E. Farmer, Portland Gas and Coke Company.
Otto Goldkamp, San Diego Consolidated Gas and Electric Co.
D. J. Gray, Pacific Gas and Electric Co., San Francisco.
J. H. Hill, Pittsburgh Equitable Meter Co.
E. H. Roseberry, Sprague Meter Company.
J. E. Spelce, California Railroad Commission.
K. C. Tomlinson, Pacific Meter Works.
Messrs. Stewart, Coble and Goldkamp have been selected to serve also on the Meter Committee of the American Gas Association.

Customers Service

A. R. Bailey, Chairman, Los Angeles Gas and Electric Corp.
W. F. Brandt, Los Angeles Gas and Electric Corp.
W. W. Fitkin, Southern Counties Gas Company.
W. F. Pape, Pacific Gas and Electric Co, Oakland.
Geo. Wehrle, Public Service Co. of Colorado.

Standard Units and Ratios for Distribution Accounting

E. G. Campbell, Chairman, Pacific Gas and Electric Co., San Francisco.
K. B. Anderson, Southern California Gas Co.
R. W. Bailey, Southern California Gas Company.
F. S. Honberger, Southern California Gas Company.
C. E. Neiderer, Portland Gas and Coke Company.
D. H. Perkins, San Diego Consolidated Gas and Electric Co.
C. H. Webber, Tucson Gas, Electric Light & Power Co.
Geo. Wehrle, Public Service Co. of Colorado.
W. C. F. West, Los Angeles Gas and Electric Corp.

Materials and Methods

W. A. Bahr, Chairman, Pacific Gas and Electric Co, Sacramento
R. C Boughton, Los Angeles Gas and Electric Corp.
W. H. Cohick, Pacific Gas and Electric Co., Oakland.
A. F. Derrick, Pacific Gas and Electric Co., Oakland.
J. J. Ferrari, Puget Sound Power and Light Co.
E. T. Floyd, Pacific Gas and Electric Co., San Francisco.
F. C. Hawks, Washington Gas and Electric Company.
J. A. Harritt, San Diego Consolidated Gas and Electric Co.
T. P. Jenkins, Pacific Gas and Electric Co., Stockton.
T. N. Kellett, Los Angeles Gas and Electric Co.
D. B. Larson, Portland Gas and Coke Company.
J. F. Leary, Pacific Gas and Electric Co., Stockton.
D. J. McCarthy, Pacific Gas and Electric Co., San Francisco.
F. P. Minton, Los Angeles Gas and Electric Corp.
D. H. Perkins, San Diego Consolidated Gas and Electrict Co.
R. V. Wilson, Pacific Gas and Electric Co., General Office.

Unaccounted For Gas

L. L. Biggs, Chairman, Southern California Gas Co.
K. B. Anderson, Southern California Gas Company.
E. A. Angley, Utah Gas and Coke Company.
F. H. Biddington, Southern California Gas Co.
R. C. Boughton, Los Angeles Gas and Electric Corp.
J. J. Breslin, Pacific Gas and Electric Co., San Mateo.
H. M. Crawford, Los Angeles Gas and Electric Corp.
J. E. C. Currens, Pacific Gas and Electric Co., San Rafael.
E. T. Floyd, Pacific Gas and Electric Co., San Francisco.
A. E. Hall, Coast Counties Gas and Electric Co.
F. A. Hough, Southern Counties Gas Company.
D. B. Larson, Portland Gas and Coke Company.
W. L. McKee, Southern Counties Gas Company.
D. H. Perkins, San Diego Consolidated Gas and Electric Co.
C. A. Renz, Los Angeles Gas and Electric Corporation.
J. T. Sullivan, Sierra Pacific Power Company.
W. F. Tyler, San Joaquin Light & Power Corporation.
Geo. Wehrle, Public Service Co. of Colorado.

Gas Regulator Performance

R. H. Hargreaves, Chairman, Pacific Gas and Electric Co., San Jose.
R. C. Boughton, Los Angeles Gas and Electric Corp.
Otto Goldkamp, San Diego Consolidated Gas and Electric Co.
A. J. McLain, Pittsburg Equitable Meter Company.
W. H. MacLean, Pacific Gas and Electric Company, San Jose.
R. M. Stewart, Pacific Gas and Electric Company, General Office.
W. I. Thrall, Reliance Manufacturing Company.

Commercial Section Committee Notes

H. P. Dockstader has been appointed chairman of the Committee on Heat Conservation. Leo Kroner, chairman of this committee last year, will continue as a member.

The Industrial Sales Committee will serve this year as the Western contact for the Industrial Survey Committee of the American Gas Association.

Additions to Accounting Section Committees

The following additions have been made to Accounting Section committees:

Executive Committee: A. B. Carpenter, Auditor, San Joaquin Light & Power Corporation; and Wm. B. Addy, Seattle Lighting Company.

Fixed Capital: H. E. Butler, Pacific Gas and Electric Company; Oakley Honey, Southern Counties Gas Company. Both Mr. Butler and Mr. Honey served with the committee last year.

Classification of Accounts: W. D. Knight, Tucson Gas, Electric Light and Power Company; Gus Hamilton, Southern Counties Gas Company.

Statistics: R. F. Allen, Pacific Gas and Electric Company; Jos. Sodoma, Southern Counties Gas Company.

Customers Records: W. F. Sheldon, Pacific Gas and Electric Company; R. J. Fabel, Tucson Gas, Electric Light and Power Company; Leland Dailey, Southern Counties Gas Company.

General Records: G. F. Mackenzie, Portland Gas and Coke Company; W. D. Knight, Tucson Gas, Electric Light and Power Company; C. A. Isbell, Southern Counties Gas Company.

Purchasing and Storeroom Accounting: A. F. Charonnat, Pacific Gas and Electric Company; L. H. Prentiss, Tucson Gas, Electric Light and Power Company.

Association Calendar

Pacific Coast Conference, A. G. A. Advisory Council and Executive Board —Los Angeles, February 6-7.

Technical Section, P. C. G. A.— March 21, Los Angeles.

Joint Meeting with Arizona Utilities and Pacific Coast Electrical Association, April 18-20.

Northwest Regional Conference— June 7 and 8, Victoria, Canada.

Annual Convention—Del Monte, week of September 11, 1929.

Commercial Section Heads in Session, Jan. 18

ON January 18 a meeting of the Executive Committee of the Commercial Section was held in Room 926 of the Los Angeles Gas and Electric Corporation Building, with Clyde H. Potter, chairman of the section, presiding.

A principal topic discussed before this meeting was the Uniform Building Code of the California Development Association. David J. Whitmer, representing the California Development Association, discussed the recent alignment of that organization's code work with the program of the Pacific Coast Building Officials' Conference, under which arrangement the P.C.B.O.C. code now stands as a temporary measure for adoption in California cities, pending final completion of the Development Association's Standard Building Code. Outside of California the code work of the Building Officials' Conference has not been affected by the merger of interests with the Development Association code program.

The balance of the meeting was given over to discussion of other Commercial Section projects, following which Chairman Potter adjourned the meeting to be called again in session sometime during the spring.

GAS INDUSTRY HAS SESSION AT WESTERN METAL CONGRESS

THURSDAY, January 17, was the day given over to subjects relating to use of gas in industrial heating operations at the meeting of the Western Metal Congress, held at Los Angeles January 14-18, 1929. The morning session, convening at the Biltmore Hotel, was sponsored by the Pacific Coast Gas Association, and was attended by over 100 industrial executives and gas men.

C. M. Grow, new business manager of the Southern California Gas Company acted as chairman for the meeting, introducing the speakers of the program.

A paper on "Gas and Electricity as Heating Mediums" by F. W. Manker, vice-president of the Surface Combustion Company of Toledo, Ohio, was read in the absence of the writer by C. B. Phillips, vice-president of that company.

J. H. Gumz, industrial engineer of the Pacific Gas and Electric Corporation of San Francisco, delivered a paper on "Heat Treating Furnace Design."

E. M. De Remer, industrial engineer of the Southern California Gas Company, talked on "Existing Heat Treating Installations," and his talk was followed by slides shown through the courtesy of the American Gas Furnace Company giving pictures of that company's installations.

C. M. Grow, chairman of the meeting, read a paper on "What the Gas Companies are doing for Industrial Heating," which was followed by a paper on "Gas as Applied to Carburizing" by Robert G. Guthrie, metallurgist of the Peoples Gas Light and Coke Company of Chicago, Illinois.

EDITORIAL

Natural Gas Accounting

SOME years ago the manufactured gas industry recognized the need for a uniform classification of accounts, and with the preparation in 1922 of the National Association of Railway and Utilities Commissioners' classification, solution of this problem for manufactured gas utilities was begun.

The natural gas industry is beginning to appreciate the necessity for developing a uniform classification of accounts which will make provision for certain conditions of production and transmission which are peculiar to itself. As a speaker before the Shreveport meeting of the A. G. A. Natural Gas Department Southwest Division pointed out, this task does not present unusual difficulties, but mainly demands that the industry come to agreement upon practices in accounting wherein there is difference at present. The classification referred to above will serve admirably as a framework on which to build.

No one needs to argue the benefits in uniform classification. Company managements, the public, financial institutions, regulatory bodies, alike call for statistical presentations of the essential facts relating to individual utility enterprises, in forms which are truly comparable. Particularly does this need apply to an industry in which investment is high, as in the natural gas industry which now employs some $1,575,000,000 in funds of security holders and financial institutions. Natural gas utilities will do well to iron out the differences which still exist in accounting methods, and then encourage the universal adoption of the classification system developed.

Employee Organizations

FORMATION of employee organizations within the ranks of a utility is a natural process, and one which originates with the employee as frequently as with the company management. Company executives are uniformly favorable to this "club" instinct. Their social benefits alone would be sufficient reason for calling employee clubs into existence, but once operating, these clubs are as invaluable to company as to employees. It is natural for them to center around company activities and problems, and with no suggestion of company domination the club organization still passes on company policy to its members.

In a number of western utilities employee clubs have been built up around a desire for training in public speaking. The prevailing popularity of speaking contests in utility association activities may have had some influence in this direction. At any rate, scores of public utility workers are gaining poise and thinking ability in the development of facility in speaking, and at the same time are increasing their value tremendously for public presentation of the facts about utility service. Other groups of utility workers are organized around first-aid work, or other equally commendable interests held in common by many employees in every company.

Employee organizations go hand in hand with a well rounded program of employee education, and in this issue of *Western Gas* readers will find an exposition of an educational program into which a number of employee clubs dovetail most effectively.

Oil Heat Salesmanship

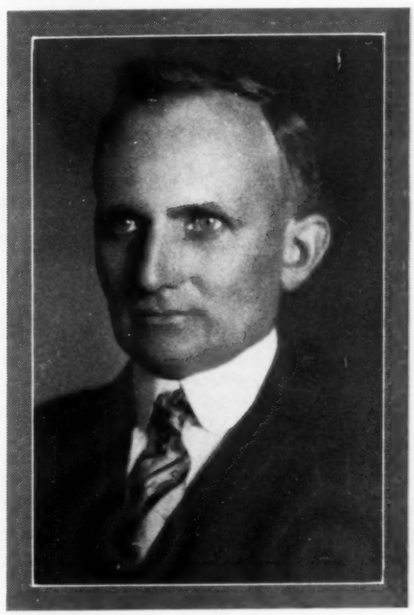
IT IS no news to gas company commercial departments that oil burner manufacturers and dealers are out after the house heating load. But perhaps it is not so generally realized that from now on the industry may expect organized, intelligent competition. National efforts of oil burner organizations, in cooperative advertising and other channels, have been discussed before in these columns. On the Pacific Coast several leading manufacturers and dealers of oil burning house heating equipment have effected similar organization for promotional purposes, and educational advertising for oil heat is now appearing in the trade press of that section.

A first important step has been taken in creation of an oil heating engineering service bureau to work with architects on application of oil heating systems to individual residence projects. In the light of this warning gas companies should redouble their efforts to give the architect the information he needs for gas heat. The entire set-up for selling gas house heating should be examined in order to close up loopholes that might admit competition which in over-all economy is not entitled to the market. Gas heat will progress only as our salesmanship is brought up to the level of our commodity, and conversely, superior salesmanship will invariably determine a competitive fuel argument when prices are at all near parity.

Employee Education *from the top down*

By D. L. Scott

Manager Public Relations
Los Angeles Gas and Electric Corporation



D. L. Scott

EDUCATION of the entire employee body, from the top down, has been receiving the earnest attention of the management of the Los Angeles Gas and Electric Corporation during the past year.

Almost immediately after his accession to the presidency April 1, 1928, Addison B. Day organized what has been known and successfully conducted as the President's Round Table. The President's Round Table meets at dinner on the last Tuesday of each month, with the President in charge. This group consists of executives, department heads, and their principal assistants. The functions of the Round Table are partly social and partly discussional. Always some assigned subject of interest to the management is treated by some member of the group well acquainted with the matter. There is also general discussion and the informal reporting of developments in the various departments.

The President's Round Table serves to bring together with the President and with one another those in charge of the various departments and activities of the corporation. The effect has been very good and meetings are held in high appreciation by those privileged to attend.

The Institute of Management: To supplement the activity of the President's Round Table, the Institute of Management was organized and has been in effect since early in November. The Institute is composed of everyone having authority in the organization, from the President down to assistant foremen and those of corresponding rank. The meetings are held in our auditorium, and are attended by aproximately 400 people, the audience being composed of the members of the Institute and their invited guests. The chief program features of the Institute each time are a discussion of some subject intimately related to our own problems, by a member of our own organization, and an inspirational address by a selected speaker from the outside. A typical program will serve to illustrate:

7:00—Social half hour, conducted by F. C. Newton.

7:30—Lecture on Glacier National Park, illustrated with lantern slides, by L. D. Kitchell.

8:00—Call to order by Chairman of the evening, G. A. Riley, Assistant Superintendent Electric Distribution.

8:50—Announcements, by the Chairman of the Institute.

8:10—Address: "The Square Deal," by O. L. Moore, Manager Customers' Department.

8:35—Address: "Teamwork," by Professor Herbert E. Harris, of Whittier College.

9:05—Adjourn.

The Institute of Management will have held five sessions during the fall and winter, and it is expected that a similar series will be held next winter.

Membership in the Institute of Management is prized by all to whom it is attainable, and attendance and interest have been highly satisfactory.

The Convention on Courtesy: Previous experience in holding courtesy conferences has demonstrated that public utility employees on what Dr. Moriarity calls "the skirmish line" are decidedly interested in the study of courtesy and its application to our problems. This year we have organized our study of courtesy in the form of a Convention, which we call "The Convention on Courtesy."

The Convention on Courtesy will hold four sessions approximately a month apart. The discussion will be on four subjects — "Courtesy Among Ourselves," "Courtesy in the Field," "Courtesy at the Counter," and "Telephone Courtesy." At the first session of the Convention two of these subjects will be presented in 20-minute talks by selected speakers. Each talk will be followed by general discussion of 10 minutes, after which the paper and the whole subject will be referred to a carefully selected committee composed of representatives of each branch of the service included in the Convention. It will be the function of this committee to draft a Courtesy Code applying to the particular subject of its deliberations, such as "Courtesy Among Ourselves" or "Courtesy in the Field."

At the second session these two committees will report their Courtesy Codes to the Convention for further discussion, amendment if desired, and adoption.

The two remaining subjects will be presented by speakers at the third session of the Convention and referred to Committees on Code who will report at the fourth and final session where the subjects will be adopted in finished form.

The Convention on Courtesy will comprise all mechanical and commercial employees whose duties bring them in contact with the public, either personally or by telephone. We know from past experience that the group which will meet in this Convention will participate actively and earnestly in the discussions of the sessions.

Course in Public Utility Practices: This is a course of study which will be given, tuition free, to all those in our organization who desire to participate. The method of presentation will be by text matter, following two weeks after assignment by classroom discussion. The texts are being prepared by those on our own official staff best qualified in the several subjects.

(*Continued on Page 61*)

Western Gas Salesmen's Competition

Prizes: $50.00 in Gold Each Month

Contest Details Published Elsewhere on This Page

Wanted: Successful Selling Ideas—from Gas Appliance Salesmen

SALES authorities would be the first to agree that the most valuable contributions to knowledge of approved selling practice must be gathered "in the field." Each commodity developes a sales approach all its own. This is as true in the gas industry as in any other—there is only one laboratory for experiments in gas appliance selling, and that is out on the firing line with the individual salesman. Here it is that sales policies are proved up, and here it is that intelligent analysis of his sales problems brings success to the gas appliance salesman.

It follows that if gas appliance salesmen can be led to exchange their experiences on sales problems, much information of definite application to selling problems will result, and *Western Gas* has given considerable thought to ways and means for making possible this exchange. It is with this purpose in mind that the publishers announce a new department, the "*Western Gas* Salesmen's Competition," which will be conducted regularly in these pages.

This department will be devoted exclusively to the man "on the firing line"—doing the direct sales work which puts appliances into the homes of gas users. In this department, which will feature contests built around successful sales methods, a premium is being put upon ideas. Each month the sum of $50.00 will be divided among the three salesmen making the outstanding contributions on the contest subject in hand.

Conditions which govern the "*Western Gas* Salesmen's Competition" appear on this page. They should be read carefully by every salesman reader, and replies for the first contest subject, on gas ranges, should be dispatched to the *Contest Editor* at the earliest moment possible.

Through this contest, which will be a regular feature of each monthly issue, gas appliance salesmen from hundreds of cities will be thrown into friendly competition—a competition which resolves itself into bringing forward sales methods which have succeeded. Readers who follow this department each month will get many an idea which can be applied to their own needs, for while local conditions may differ to a degree, sales practice which brings results under one set of conditions will work under the same general conditions in another locality.

Watch this department of *Western Gas* for contest subjects. Next month another contest topic will be announced, and winning replies for the first competition, on "The Three Most Effective Arguments I Use in Selling Gas Ranges" will be published in the April issue. Each month, beginning with April, this department will contain the three winning replies to the current contest subject, together with other valuable material gleaned from the replies submitted.

The present year, which gives every promise of being emphatically a sales year for gas utilities, is particularly appropriate for conducting such a contest as the one announced herein. Company executives are more "sales-minded" than ever before; 1929 budgets have provided liberally for sales promotion, and salesmen will have the support of advertising and other aids which figure in a well-rounded sales program. And too, the industry is giving thought for the first time to a general program of sales training for individual salesmen, in the American Gas Association's training course for domestic salesmen. The gas industry is out to improve its sales techinque—a point of admitted weakness in its armor to date—recognizing that this is its only recourse if it would make head against the aggressive sales advance of its competitors.

CONTEST CONDITIONS

Subject: "THE THREE MOST EFFECTIVE ARGUMENTS I USE IN SELLING GAS RANGES"

Who May Compete: Any regular reader of WESTERN GAS who is engaged in selling gas appliances to the public, either through gas utilities or dealers.

Prizes: For the most convincing three arguments, $25.00 in gold. For the second best three arguments, $15.00 in gold. For the third best three arguments, $10.00 in gold.

Contestants will be limited to 100 words for each argument—entire reply not to exceed 300 words. No mention of manufacturers' products by trade name may be made, and contestants should refrain from comparing one manufacturer's product directly with another.

Manuscripts must reach publication offices of WESTERN GAS, not later than *March 11, 1929.* Address all communications to *Contest Editor,* WESTERN GAS, 124 West 4th Street, Los Angeles, Calif.

Name, address, company affiliation and position of contestant must appear on each page of manuscript. Double-spaced, typewritten replies, printed on one side of sheet only, are preferred. Manuscripts become property of WESTERN GAS, to be published or withheld as desired, and no responsibility for their return is assumed.

Winning replies will be published in the April issue of WESTERN GAS and prize money paid to winners at that time.

Judging of replies will be conducted by Clifford Johnstone, Executive Secretary of the Pacific Coast Gas Association, assisted by a committee.

Monthly Contests: **In the March issue of *WESTERN GAS* another Salesmen's Competition, open to readers of *WESTERN GAS* (Prizes, $50.00 in gold) will be announced, the winning replies to be published in the issue of May, 1929.**

INDEPENDENCE, MO., TO HAVE GAS FROM KANSAS

Independence, Mo., is to be supplied with natural gas from the shale gas wells in Missouri and Kansas, according to announcement. Gas will be supplied to the local distributor, the Jackson County Light, Heat and Power Company, by the Missouri-Kansas Pipe Line Company.

BRENHAM, TEXAS, TO BE SUPPLIED WITH GAS

Brenham, Texas, will be supplied with natural gas in the near future, following decision to that effect by the city commission. The Texas Cities Gas Company holds the franchise in that city.

Pacific Coast Companies Foretell Year *of* Aggressive Selling

LAST month WESTERN GAS was requested through the Sales Budgets Committee of the Pacific Coast Gas Association to present all available details on 1929 merchandising and sales promotional plans of Pacific Coast gas utilities in the current issue. Letters requesting this information were dispatched to commercial department heads of the various companies, and the particulars detailed below are the result. The companies represented will do the bulk of all appliance sales work conducted through gas companies on the Coast, and hence these statements take on considerable significance, telling as they do of well organized programs for a year of intensive sales development.—EDITOR.

B. C. ELECT. POWER & GAS CO.

FROM British Columbia Electric Power & Gas Company of Vancouver, B. C., comes a detailed outline of the appliance sales plan of the company for 1929. The campaign will be thorough-going, and over the period of 12 months will cover the entire larger appliance field.

During February and March special effort will be made to bring to life dead services by means of exceptionally low terms. The months of April and May will be devoted to a campaign for the sale of gas ranges; June will feature automatic water heaters and gas-fired refrigerators. July will emphasize ranges again, and in August the company will remind the public that new house-heating equipment should be installed before the frosty months. During September a combination offer will be made at especially low terms on range, water heater and heating equipment. During October and November the attractiveness of radiant type heaters will be emphasized.

Details on the individual campaigns planned for 1929 follow:

February-March: Any gas range selling up to $40.00 on ordinary lease terms will be connected ready to use for a first cash payment of $1.00, and a balance of $1.00 per month. On larger purchases monthly payments will be increased by 50 cents for every additional $25.00. Any hot plate will be installed ready to use for a first cash payment of 50 cents, with a monthly payment of 50 cents on the balance. Connections will be charged at the regular rate for time and material.

April 15—May 15: Gas water heater will be given free with purchase of any heat controlled cabinet gas range. Regular lien terms will prevail.

June: Any automatic water heater will be connected ready to use for a first cash payment of $10.00, and the balance to be paid in 18 monthly payments. Any refrigerator will be installed for a first cash payment of $10.00 with the balance to be paid monthly over a period of 18 months. Refrigerators will be installed on a basis of 30 days free trial for customers of approved credit standing.

July: Any range will be sold for $1.00 down, the balance to be paid in 12 monthly installments.

August: Gas-fired warm air furnaces will be installed for a first cash payment of $15.00, with the balance to be paid in 18 monthly installments.

September: A combination offer will be made of range, water heater and gas-fire, with a payment of $5.00 down, the balance to be met over a period of 18 months.

October-November: Any gas-fire will be installed for $1.00 down, the balance to be made in 12 monthly payments.

PACIFIC GAS AND ELECTRIC CO.

THE 1929 gas sales plan of the Pacific Gas and Electric Company, embracing practically all of northern California's population, is, in effect, a continuation of the plan as outlined and launched in 1928. The company believes, and in a formal statement of its policy, announces, "that an organized effort of the entire industry is essential if the maximum amount of business is to accrue to each group through creation of consumer acceptance" of gas and gas products.

The company further says that "it is the duty of the utility particularly to do pioneering selling in that appliance field where there is no public demand or due to special conditions no adequate profit for creative and aggressive selling by retailers."

All sales plans of the P. G. and E. are primarily load building plans. It has been estimated that a potential increase in gas revenue of $1,772,000 per year is to be gained from present services plus normal increase if the proper creative selling is employed.

Gas sales objectives as outlined by the Gas Sales Department are to:

1. Increase load.
2. Create more favorable contact with consumers.
3. Increase market for gas appliances and meet competition.
4. Cooperate with the dealer trade.

Plans for creative selling in 1929 may be briefed as follows:

1. Industrial:

18 sales engineers; cost, $58,450.
Furnace and equipment to be sold, $25,000.
Installation materials and labor, $30,000.
Number of creative calls, 10,000.

2. Hotel and restaurant equipment sales:

8 sales engineers; cost, $25,650.
Total value ranges to be old $50,750.
Quota of new jobs, 600.
Quota of replacements, 125.

This department will cooperate with equipment dealers on new jobs, and make direct sales on jobs where gas can be sold to replace coal and oil.

3 Domestic sales:

100 salesmen; cost, $187,480.

Number of creative calls on prospects, 275,000.

Sales literature, booklets, broadsides, and bill inserts to be mailed, personally distributed and followed up. Total number of pieces sales literature, 2,000,000.

Newspaper advertising in 60 papers, 75,000 column inches.

Sale of auxiliary heating appliances, automatic water heaters and ranges in certain specified portions of the territory.

Range quotas, P. G. & E. 1,250; dealers 37,000.

4. House Heating:

Direct selling in all territories to both old and new jobs, cooperating with established heating trade dealers wherever possible.

Quotas: Furnaces and boilers, P. G. and E., 1180; dealers, 1500. Smaller heating appliances, P. G. and E., 4725; dealers, 10,000.

A summary of the estimated appliance sales for the entire P. G. and E. territory is as follows:

Total industrial	$ 55,000
Hotel and Restaurant	50,750
Domestic house heating	750,000
Water heaters	1,850,000
Gas ranges	3,150,000
Grand total estimate	$5,865,000

Exclusive of the commissions to salesmen, the Pacific Gas and Electric Company's contribution amounts to $400,830. One hundred and thirty-three salesmen will be employed, and their calls on prospects will total 290,000.

PORTLAND GAS AND COKE CO.

FOLLOWING is a statement which has been received by *Western Gas*, outlining the merchandising program of the Portland Gas & Coke Company of Portland, Oregon, for the year 1929.

"In preparing for a very active schedule of sales campaigns for 1929, the advertising appropriation for the Portland Gas and Coke Company has been increased this year as compared to last year, the management feeling that very material results are obtained from this form of sales promotion.

"As a consequence the appropriation for advertising for appliance sales and gas promotion has been increased from $30,000 for 1928 to $40,000 for 1929. In addition an amount of $17,000 has been budgeted for the promotion of briquet sales by means of advertising.

"The sub-division of the gas promotion and appliance advertising budget is in the proportion of $30,000 for gas promotion and $10,000 for strictly appliance sales. These two items are so inter-related that many times it is difficult to distinguish charges between gas promotion and direct appliance selling.

"It is contemplated to use nearly every form of advertising, although by far the larger proportion of the $40,000 appropriation will be used for newspaper advertising,

as this is considered the best means for reaching the buying public in the district. The estimated division of advertising through various mediums is as follows: Newspaper advertising, 70 per cent; billboards, 15 per cent; radio, 1 per cent; specialty advertising which might be characterized as "stunts," 3 per cent; car cards, 3 per cent; and finally, direct mail advertising letters, broadsides, gas bill stickers, etc., 8 per cent.

"Starting off with a campaign on Gas Heatrolas, which ties in with national advertising done by the manufacturer, a series of campaigns will be held on Radiantfires, ranges, water heaters, house-heating and refrigeration. By these active selling campaigns backed up by the many forms of advertising, it is anticipated that gross sales will approximate $525,000. To accomplish this result will require the co-operation of the advertising department in informing the public, the salesman in following up the interest created by the advertising, the office department in execution of the orders, and finally by the operating department in installing the appliance with despatch and in the best possible manner. Even then the work is not complete until the home service department has followed up the installations of ranges, and informed the user of the range regarding the proper care and use of the appliance. All of these operations are building for future sales."

SOUTHERN CALIFORNIA GAS CO.

THE sales quota set by the Southern California Gas Company for the year 1929 would indicate that the company plans to make this year an outstanding period of sales. The amount set aside for the sales and advertising budget is $600,000, to be divided as follows: central division, $186,000; northern, $130,000; eastern, $120,000; southern, $90,000; San Joaquin, $48,000.

In the sales budget of the company is an item of $50,000 for advertising. This amount to be placed in newspapers throughout territory served by Southern California Gas Company.

Cooking schools, established in different towns, are also to be supported as advertisement aids.

For appliance salesmen's compensation the company has specified in the budget each salesman shall receive a salary of $100, a monthly bonus of $10.00, together with a commission of five per cent on gross sales. One hundred dollars in prizes is also to be distributed each month among the salesmen.

SAN DIEGO CONSOL. GAS & ELEC.

Although the San Diego Consolidated Gas and Electric Company of San Diego, California, does no gas appliance merchandising, approximately one-third of the 1929 advertising appropriation is alloted to gas advertising, the amount named for this purpose being $12,000. Newspaper advertising will predominate, tieing in with dealer activities and featuring cooperation with architects and builders.

SOUTHERN COUNTIES GAS CO.

SOUTHERN Counties Gas Company, with headquarters at Los Angeles, will increase its 1929 new business apropriation over that of 1928 by a substantial amount. Active campaigning will be continued to increase the gas load through the sale of automatic storage water heaters as well as by the sale of oven controlled gas ranges, space heaters, unit furnaces, and gas steam radiators. An active campaign will be made during 1929 for gas-fired refrigeration, and a concentrated effort will be made to sell small domestic appliances such as gas toasters, waffle irons, corn poppers and gas percolators.

The pace which this company may be expected to set it the sale of gas appliances during 1929 is indicated in the fact that during the past year gross sales amounted to $689,310.77, exceeding by $100,000 the quota for the year.

An increase in the 1929 advertising budget will also be made, the company's program calling for newspaper display, direct mail, bill-board and window display advertising.

Special attention will be paid by the company to the sale of school and domestic science equipment, and in developing the bakery, restaurant and commercial load.

SANTA MARIA GAS CO.

Santa Maria Gas Company of Santa Maria, California, has appropriated approximately $4,000 for the company's advertising and merchandising program for 1929, according to a report received by *Western Gas*. A substantial portion of the budget will be given to newspaper advertising.

NEW CLARK CO. REPRESENTATIVE FOR SO. CALIFORNIA

Edward P. Millikan of the Geo. M. Clark & Company is spending a month in California. Mr. Millikan is introducing to the trade Ernest B. Hanmer who is the new representative for the Clark Company in the Southern California and Arizona territory.

1929 Calendar

Advisory Council and Executive Board, A. G. A.—Los Angeles, Feb. 6 and 7, 1929.

Mid-West Regional Sales Conference, Commercial Section, A. G. A.—Chicago, Illinois, February 14 - 15, 1929.

Southern California Meter Association—February 28, place to be announced.

Technical Section, Pacific Coast Gas Association—Los Angeles, March 21.

Oklahoma Utilities Association—Oklahoma City, March 12, 13, 14, 1929.

Mid-West Gas Association—Minneapolis, Minn., April 15, 16, 17, 1929.

Arizona Utilities Association—Tucson, Ariz., April 18-20, 1929.

Arkansas Utilities Association—Hot Springs, Ark., April 30-May 3, 1929.

Natural Gas Dept. of A. G. A.—Kansas City, May 6-10, 1929.

Natural Gasoline Association—Tulsa, Oklahoma, May 21-22.

Northwest Conference, Pacific Coast Gas Association—Victoria, British Columbia, June 7-8, 1929.

Canadian Gas Association—Ottawa, Canada, June 13-14, 1929.

Pacific Coast Gas Association Annual Convention—Del Monte, Calif., week of September 11, 1929.

American Gas Association—Atlantic City, October 14-19, 1929.

Mid-West Regional Sales Council Meets

A MEETING of the Mid-West Regional Sales Council was called on January 7, at the Peoples Gas Building, Chicago, Illinois, for the purpose of determining the time, place, and program of the next meeting of the Mid-West Regional Sales Conference, sponsored by the Commercial Section of the American Gas Association.

It was decided that Chicago is the most central point for members from the seven states of Illinois, Indiana, Missouri, Michigan, Iowa, Minnesota and Wisconsin, which are covered by the conference.

Arrangements were made for the meeting of the Conference to be held at Hotel Sherman, on Thursday, February 14 and 15.

Those attending the meeting of the Council were: F. X. Mettenet, chairman; H. L. Brown, regional secretary; J. W. West, Jr., secretary; J. J. Burns, J. W. Busch, H. L. Dunavan, W. R. Evans, C. A. Gould, C. H. Kallstedt, C. A. Luther, F. C. Mackey, C. A. Nash, M. F. North, L. R. Parker, P. D. Warren, R. G. White, F. M. Rosenkrans.

WISCONSIN UTILITIES ASS'N. HOLDS CONTEST FOR WOMEN

The Wisconsin Utilities Association is sponsoring a contest for women which will close May 1, 1929. The contest covers the programs presented in the various communities by the women's organization in the company offices in each unit. The women's organization in each instance is to keep a record of programs and attendance, including such other information as is necessary to determine which group has carried out the most constructive and useful program during the term of the contest. The committee of judges consists of Estelle Rowe, assistant secretary of the Wisconsin Railroad Commission; May S. Fletemeyer, Northern Indiana Public Service Company, Hammond, Indiana; A. F. Berwig, director, Wisconsin Public Utility Information Bureau, Milwaukee.

WORK ON WYOMING-UTAH PIPELINE IS STARTED

WITH the organization of the Unitah Pipe Line Company and the Wastach Gas Company plans are well underway for the completion of the project to bring natural gas to Utah from Baxter Basin, Wyoming. The Unitah Pipe Line Company, a subsidiary of the Western Public Service Corporation, will build the line; while the Wasatch Gas Company, also a subsidiary of the same company will distribute gas in the rural districts of Utah served by the line. The Western Public Service Corporation will distribute gas in Ogden and Salt Lake City, and will act as a holding company for the stocks of the other organizations.

Work of laying the gas pipeline has begun, with the operation of the first trencher between Salt Lake City and Coalville. This line will be of 16-inch welded pipe. Two other trenching outfits will be at work early in February to complete the pipeline triangle between Ogden, Coalville and Salt Lake City. From Coalville the line will run to Rock Springs, Wyoming, 122 miles away. Another ditch digging outfit will be unloaded at Rock Springs to work in the section between that town and the terminus of the line at Hiawatha, 66 miles away.

The A. O. Smith Corporation has received an order for about 33,000 tons of welded pipe from the Western Public Service Corporation, recently organized to develop the natural gas project in Utah.

Natural Gas Department Plans *for* May Reunion

PLANS are advancing for the annual convention of the Natural Gas Department of the American Gas Association, to be held in Kansas City, Missouri, May 6, 7, 8. Committee to take charge of convention detail have been named by the Department. The Program Committee will be headed by A. W. Leonard of the Devonian Oil Company of Tulsa, Oklahoma; T. J. Strickler of the Kansas City Gas Company will have charge of convention entertainment; F. M. Rosencranz of the Gas Service Company of Kansas City has been named chairman of the Exhibition Committee.

C. W. Bergman, director of exhibits for the American Gas Association, will be in charge of the Exhibition. A prospectus has been published by the Exhibition Committee of the Convention, giving detailed information concerning the space available, together with rules and regulations governing the use of the booths. Indications are that the coming Convention and Exhibition will surpass all expectations and requests for space are exceeding those of previous years by a wide margin.

Members of the Committee in addition to Mr. Bergman are: F. M. Rosenkranz, O. T. Dawson, W. E. Derwent, N. A. Newton, E. F. Schmidt, Fred H. Thomas, H. Leigh Whitelaw, and Charles R. Zeskey.

ACTIVITIES OF SO. CAL. GAS BUREAU ANNOUNCED

The Southern California Gas Bureau, formed by the commercial departments of the Los Angeles Gas and Electric Corporation, Southern Counties Gas Company, and Southern California Gas Company, to conduct cooperative enterprises of a sales promotion nature, has made arrangements to conduct an exhibit at the Pacific Coast Regional Convention of the National Hotel and Restaurant Men's Association, which is called into session at the Hotel Alexandria in Los Angeles on February 25, 26, 27. Heavy duty restaurant equipment and other gas burning specialties of interest to this industry will be on exhibit, a number of items never before exhibited on the Coast being brought here for that purpose.

At the Los Angeles Food Show to be held in the Ambassador Autidorium in Los Angeles, March 10-14, the Gas Bureau will be represented by several attractive booths showing modern, automatic gas burning equipment.

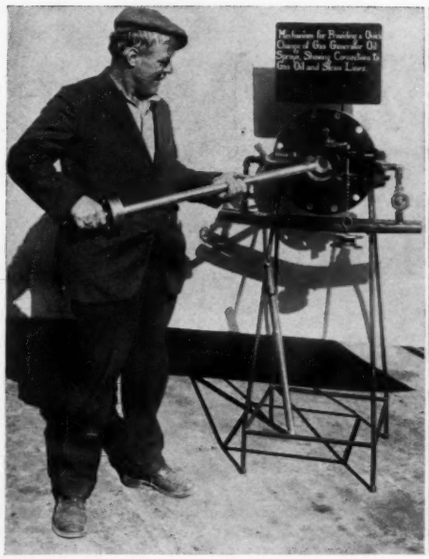
NEW PLANT OF B. C. ELECTRIC CO. NOW IN OPERATION

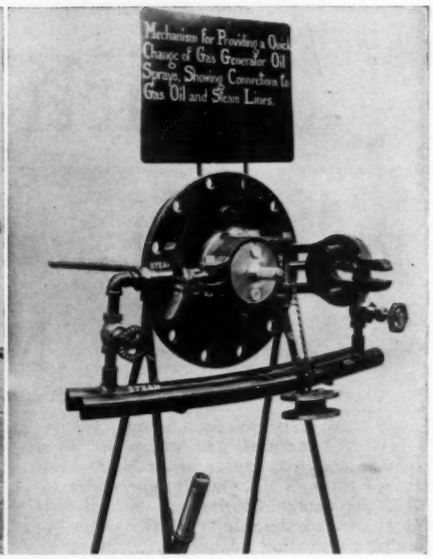
Augmenting the present gas supply of the B. C. Electric Railway Company, the first unit of the company's new plant at Vancouver, at the eastern end of Georgia viaduct, has been placed in operation.

The second unit of the addition is being completed, and will be in operation shortly, increasing the production by another 1,700,000 cubic feet a day.

INSULL UTILITY INVESTMENTS, INC., IS NAME OF HOLDING CO.

Samuel Insull has announced the formation of Insull Utility Investments, Inc., which will handle securities of the Insull managed utilities. The new organization, which holds securities amounting to approximately $24,000,000, will take over Insull, Son & Co., Inc., and its subsidiary, Insull, Son & Co., Ltd., of London.





Mechanism Facilitating *the* Quick Change *of* Oil Gas Generator Sprays

By T. N. KELLETT

Superintendent of Gas Manufacture
Los Angeles Gas and Electric Corporation

IN THE PARAGRAPHS below Mr. Kellett has summarized for *Western Gas* his contribution on the subject of oil gas generator sprays, presented in a Technical Section symposium at the Coronado convention of the Pacific Coast Gas Association.—*Editor.*

IN THE operation of the average large oil gas plants where there are from fifteen to twenty-one sets of oil gas generators, or from thirty to forty-two single shell straight shot oil gas generators, there is considerable time lost on account of having to clean or repair the make oil sprays daily.

These photographs of injector housings represent the old and the improved type of housing for oil gas injector sprays. With the old type of housing it took on an average of about four hours for one man to remove twenty oil injectors, and on an average of about four hours for one man to re-install them after making the necessary examination and repairs. It is necessary to remove them on an average of once a week. With the new type of oil injector housing one man can remove the twenty injectors in one hour and after making necessary examination and repairs he can re-install them in an hour, requiring eight man hours, as compared to two man hours with the new type. Thus the saving in time and expense can readily be appreciated. The new type of housing does not have any pipe and fittings that have to be unscrewed like the old type. Therefore, the oil and steam leaks around the generator steam and oil loops are reduced to a minimum.

Another economical point of operation is that at times it is necessary to lay a generator out for periods from four hours to two and three days. With the old type housing it was necessary to keep steam passing through the oil injector in order to keep the injector from burning up. In the event the generator was required for service, it took considerable time to install the injectors. As a result they were left in the generator and steam was passed through in order to have them in condition for service when needed. With the new type injector housing, if a generator is to be laid out for any considerable length of time, removal of the injectors can be accomplished very easily and a considerable saving created on account of the injectors being removed, and consequently no steam is required to keep them from burning off.

Another feature of time saving is that the sprays requiring changing can be changed when the generator is on the heating period, inasmuch as the operator can change or remove a spray, if necessary, in about one minute and install a new one in place of the one he removes.

OKLAHOMA UTILITIES ASS'N. TO MEET MARCH 12-14

The eleventh annual convention of the Oklahoma Utilities Association will be held in Oklahoma City March 12-14, with headquarters at the Huckins Hotel. Much preliminary work has been done, and indications are that the convention will break all former records for attendance and program.

E. F. McKay is in charge of the Convention Committee, and with him are serving O. F. Hall as chairman of the Exhibits Committee; Mrs. J. M. Gayle, chairman of the Hostess Committee: Glenn Kiley, chairman of the Reception Committee; M. A. Sanders, chairman of the Entertainment Committee.

SAM CARNEY WILL HAVE CHARGE OF SHELL CO. DEVELOPMENT

Sam Carney, well known in the natural gasoline industry in the Mid-Continent field, and formerly director of the research work of the Shell company's natural gasoline plants at Tulsa, has been appointed director of research for the Shell Development Company at San Francisco. In his new position he will have charge of all the development work for the Shell company.

With *the* Metermen

Effect *of* Low Rates *of* Flow *through* Orifice Meter Installations

By L. O. BONNER
*Standard Gasoline Company**

IT IS customary to account for all gas leaving a natural gasoline plant as a percentage of the gas received and measured through the plant intake meters.

This percentage of dry gas returned is subject to considerable variation, due to changing operating conditions; however, there are occasions where the actual amount of gas measured from a plant has fallen considerably below that which would be available after the various allowances were made for gasoline extracted, water vapor condensed, plant fuel, and any other known losses.

That is, when a comparatively large volume of gas is available and all discharge meters are measuring volumes well above their minimum capacities, the gas accounted for by the plant discharge meters checked closely with the amount of gas that was computed to be available; but when the volume of intake gas decreases until the discharge gas available is all utilized either by fuel requirements, gas lift, or the public utility, the percentage of gas actually sold decreased below what could be accounted for by the usual procedure. Under these conditions the stack gas meter would normally measure "no gas" or at most, an indicated flow during short intervals widely separated.

After the usual procedure of checking the differential gauges, orifice plates, flow conditions and investigating possible losses inside the plant, it was noticed that some gas seemed to be escaping out the stack, although the back pressure regulator was closed and no record of gas passing was being obtained by the differential recorder. It was decided to determine, if possible, the amount of gas that might pass through the stack gas meter installation and regulator without recording on the meter chart. The stack gas meter and regulator as usually installed operate to protect the absorption system against excessive pressures which might damage equipment or otherwise demoralize normal plant operation, by relieving the gas to the atmosphere when occasion arises.

In order to measure the maximum rates of flow an installation must be large enough to handle the volume wasted if the sales line or any other line handling a large volume were closed temporarily. The procedure determined was to measure the volume that would pass, without making an observable differential record, on the orifice meter chart.

The first tests were made on a 4-inch standard 18-diameter meter run, using both a 50-inch differential and a 10-inch differential gauge.

The 4-inch meter run was connected in series with the 10 LT-B and 60 LT-B displacement meters set in parallel with the necessary valves and fittings for controlling the flow. The pipe used in the meter run was selected for size and trueness and was cleaned after the meter run was completed. The orifice plates used were "miked" within .0005 inches and especial care was taken to prevent damaging them. The various precautions to get an accurate record with an orifice meter installation were taken, in-

*Presented before the Southern California Meter Association at Long Beach, Calif., December 27, 1928.

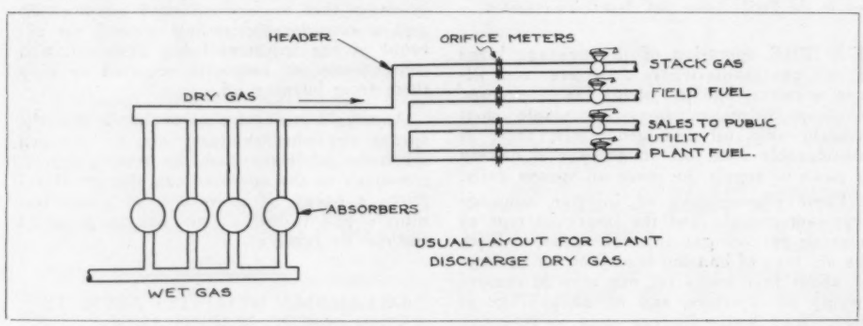


Fig. 1

SO. CALIF. METER ASS'N. ENJOYS ANNUAL HI-JINKS

One hundred and sixty members and friends of the Southern California Meter Association gathered at 7:00 p. m. on January 25, at McFarland's Cafe in Fullerton, California, to enjoy the Annual Hi-Jinks of the organization. Each member was entitled to bring one friend, and an atmosphere of high festival prevailed during the gathering, at which President B. M. Laulhere acted as master of ceremonies.

Music was rendered by an orchestra during the banquet, after which entertainment was provided for the members and their guests. There were no speeches, the program being made up of songs and dances, and was under the direction of Malcolm Miller, of the Southern Counties Gas Company, chairman of the entertainment committee, assisted by Carl W. Brockman of the Union Oil Company of California.

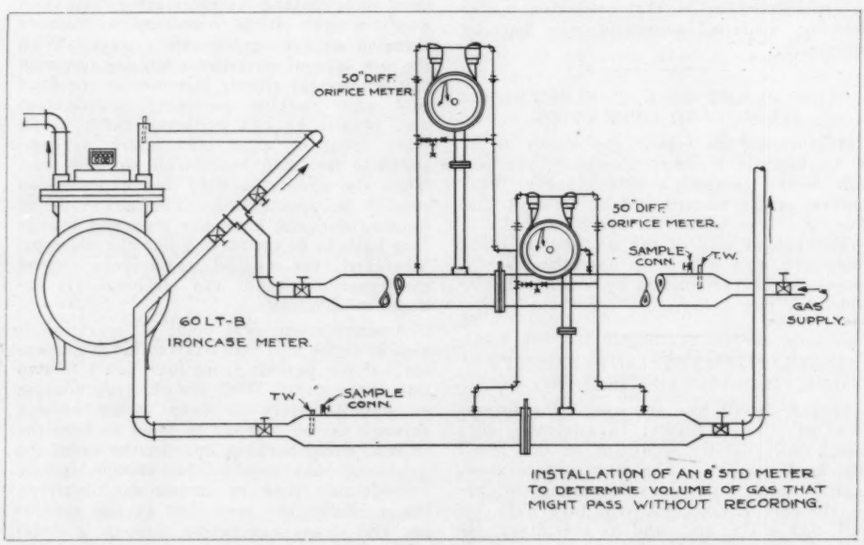

50" DIFF. ORIFICE METER.
50" DIFF. ORIFICE METER.
SAMPLE CONN.
T.W.
GAS SUPPLY.
60 LT-B IRONCASE METER.
T.W.
SAMPLE CONN.
INSTALLATION OF AN 8" STD METER TO DETERMINE VOLUME OF GAS THAT MIGHT PASS WITHOUT RECORDING.

Fig. 2

cluding an inspection and test of all valves and fittings under pressure with soap suds.

An hourly clock was used to obtain a complete chart record in one hour, as most of the volumes were determined for that period and the rate computed on a 24-hour basis.

The procedure determined was to install an orifice disc in the 4-inch meter run and open a valve on the downstream side of the meter until a definite indication of flow was established on the chart, then "pinch" back until the differential gauge showed zero again.

Then the volume passing was corrected for temperature to 60°F and computed as the rate for 24 hours.

Specific gravity tests were made daily; also the gasoline content was determined. Four or five determinations were made for each size disc and the average volumes, computed on the above basis, were used to draw the curves. The graph of the averages shows that a 40 pounds gauge pressure it is possible for 65 M.c.f. to pass through a 2½-inch disc in a 4-inch meter run without making a definite differential record on the recording chart.

The smaller volumes passed, without recording on the 10-inch differential chart, are larger than would be expected; but since the amount of friction is practically the same a considerable similarity would be expected in the curves.

After the above results were compiled a computation was made based on the relation of the air coefficients for different sizes of lines. and it was estimated that an 8x4-inch disc might pass 147 M. c. f. in 24 hours at 40 pounds pressure. Therefore, to determine what might be expected in actual practice an installation was made similar to the previous one except that an 8-inch standard meter run replaced the 4-inch meter run and the 4-inch installation was changed to measure rates of flow above the combined capacity of the positive meters. The procedure was similar to previous tests in that gas was passed through the 8-inch meter installation at a rate that would not show an indication of flow on the recording chart. Then it was measured either by the positive meters or the 4-inch orifice meter installtion.

The result of this series of tests were plotted using the

$$\text{X value} = R = \frac{\text{Diameter of orifice}}{\text{Diameter of line}}$$

against the volumes in thousands of cubic feet per 24 hours. The average volumes were used to plot the points; also the results of the previous tests using the 4-inch meter installation were plotted on the same sheet.

The average volumes for the various sizes of orifice plates, using an 8-inch line at 39 pounds gauge pressure are shown below:

Size—Line and Disc	*Comput. Actual Differential Inches Water*	*24-Hour Rate*
8x1	.0567	10.6 Mcf
8x1½	.0400	20 Mcf
8x2	.0349	34 Mcf
8x3	.0224	64 Mcf
8x3½	.0466	131 Mcf
8x4	.0406	173 Mcf
8x5	.0523	349 Mcf

The rates of flow where a change was noted in the differential reading when the gas was shut off, are omitted from these averages, and only the volumes used where there was no observable change in the differential reading when the gas was shut off.

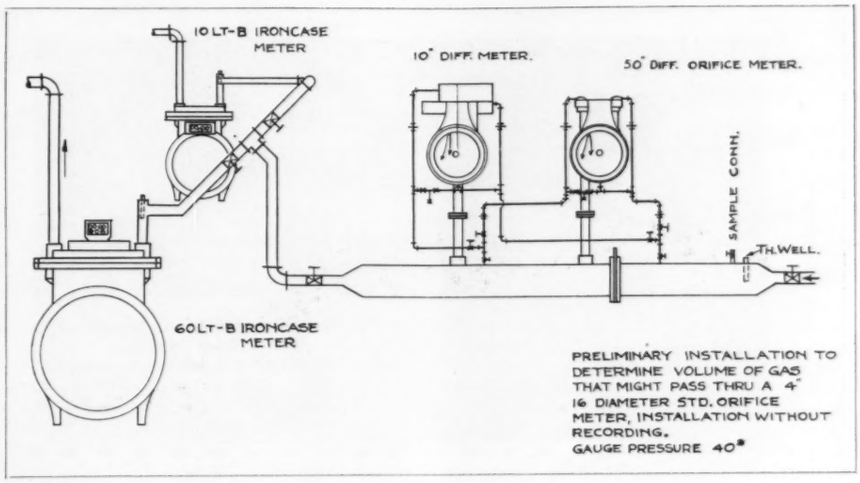

10 LT-B IRONCASE METER
10" DIFF. METER.
50" DIFF. ORIFICE METER.
SAMPLE CONN.
TH. WELL.
60 LT-B IRONCASE METER
PRELIMINARY INSTALLATION TO DETERMINE VOLUME OF GAS THAT MIGHT PASS THRU A 4" 16 DIAMETER STD. ORIFICE METER, INSTALLATION WITHOUT RECORDING.
GAUGE PRESSURE 40#

Fig. 3

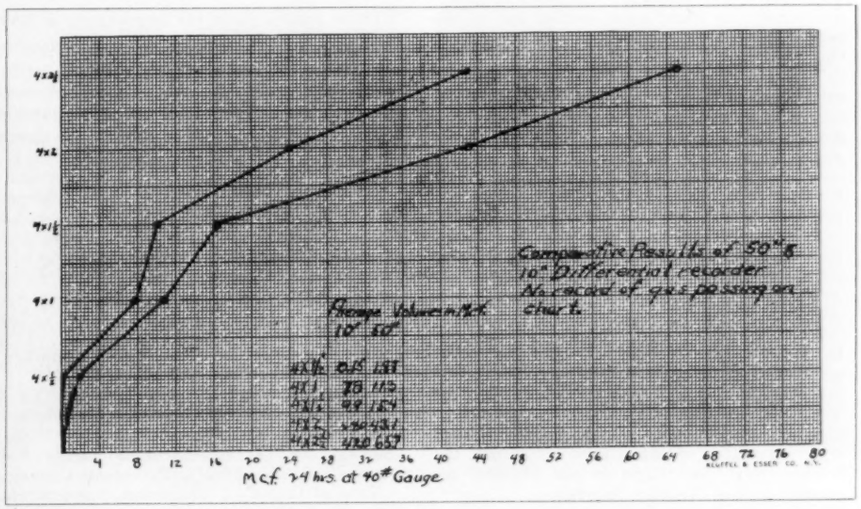

Compative Results of 50" & 10" Differential recorder No record of gas passing on chart.
Flange Values in M.C.F.
10" 50"
4x½ 0.15 1.88
4x1 .78 1.15
4x1½ .88 1.64
4x2 1.36 4.87
4x2½ 4.20 6.57
4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
M.c.f. 24 hrs. at 40# Gauge

Fig. 4

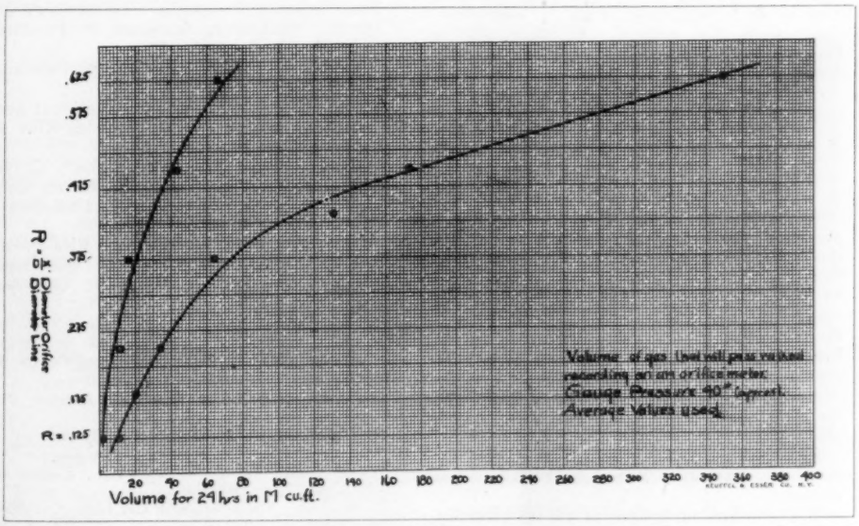

.625
.575
.475
.375
.275
.175
R = .125
R or K Diameter Orifice Diameter Line
Volume of gas that will pass through recording on an orifice meter. Gauge Pressure 40" (approx.) Average Values used.
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 400
Volume for 24 hrs in M cu.ft.

Fig. 5

From the above results it will be observed that an 8-inch orifice meter installation operating at approximately 40 pounds gauge pressure with a 4-inch disc might loose 173 M.c.f. a day, which at 9c a thousand would be $15.57. This amount of gas leaking by a regulator would probably be noticed by the operator, but the indications are that

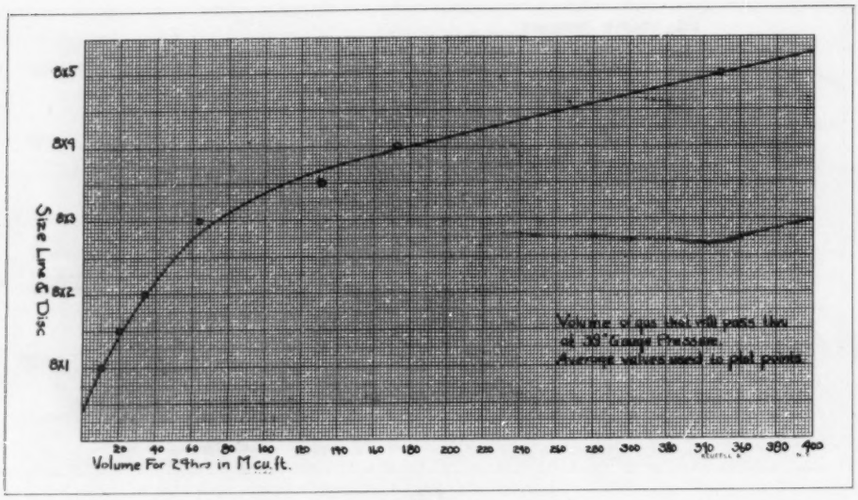

Size Line & Disc
Volume For 24hrs in M cu.ft.
Volume of gas that will pass thru
at 30" Gauge Pressure
Average values used in plot points

Fig. 6

this conditions could exist and as far as the person computing the charts was concerned, "no gas" would be the daily figure.

The mechanical condition of the differential recording gauge is the principal factor in determining the amount of gas that will pass through a given installation under a given set of conditions.

These results show the importance of having a positive, dependable, automatic method of preventing any leakage through orifice meter installations on waste gas or "stack" meters, when the volume of gas handled decreases to a point that makes its utmost utilization necessary and important.

Western Conference *in* Progress

(Continued from Page 20)

in Hollywood, Wednesday evening. Another entertainment feature was the ladies' luncheon at the Los Angeles Women's Athletic Club Wednesday noon. Friday morning, February 8, many of the eastern visitors will leave for Agua Caliente, across the border from San Diego in old Mexico, returning to Los Angeles Saturday.

Alexander Forward, managing director of the American Gas Association, opened the afternoon meeting of February 6, presided over by B. J. Mullaney, A. G. A. vice-president, with his address on "Agencies of Progress. Mr. Forward's message is published elsewhere in this issue.

Other addresses on the afternoon program were those by E. H. Bauer, general manager, Worcester Gas Light Company, on "The New England Plan of Cooperative Advertising," discussion on which was led by C. B. Babcock; F. U. Naylor, manager of gas sales for San Francisco, who read the paper prepared by R. E. Fisher, vice-president of the same utility, on "Dealer Cooperative Relations on the Pacific Coast"; C. O. G. Miller, president of the Pacific Lighting Company, who spoke on "Public Utility Financing on the Pacific Coast"; and H. E. Bates, chairman of the American Gas Association's Technical Section, who read H. C. Abell's paper on "The Research Program of the Gas Industry," which appears on another page of this issue.

At the close of the program of papers the A. G. A. Executive Board held its business session.

The concluding session of the Conference, Thursday morning, February 7, over which C. H. Dickey will preside, will cover the following program:

"The Pacific Coast, Its Influence and Importance", LeRoy M. Edwards, General Counsel, Southern Counties Gas Company.
"Conservation of Natural Gas", A. F. Bridge, Vice-President of Operation, Southern Counties Gas Company.
"Utilization of Refinery Gas", W. S. Yard, Vice-President Gas Operation, Pacific Gas and Electric Company.
"Storage and Measurement of Large Volumes", S. W. Meals, President Carnegie Natural Gas Co.; Chairman, Natural Gas Dept., A. G. A.
"Manufactured Gas Technical Developments", C. J. Ramsburg, Vice-President, The Koppers Company. To be read by Donald McArthur, Seaboard By-Products Coke Co., Newark, N. J.
Discussion, E. L. Hall, Gen'l Supt., Portland Gas & Coke Co.
Discussion, H. L. Masser, Vice-President and Executive Engineer, Los Angeles Gas & Electric Corporation.
"Propane and Butane Competition", C. A. Munroe, President, Northern Utilities Co.; and R. G. Griswold, Chief Technician, Cities Service Company.
Closing Remarks, B. J. Mullaney, Vice-President, The Peoples Gas Light & Coke Company; Vice-President, American Gas Association.

ATTENDANCE

Visitors to the Pacific Coast registered at the conference include the following:

Mr. and Mrs. Donald McArthur, Koppers Co., Pittsburgh, Pa.
R. P. Dorland, Utility Insurance.
A. F. Staniford, V. P., Brooklyn Union Gas Co.
H. O. Loebell, V. P. & Gen. Mgr., Combustion Utility Corp., New York City, N. Y.
E. H. Bauer, Mgr., Worcester Gas Light Co., Worcester, Mass.
F. A. Lemke, Gen. Mgr., Humphrey Co., Kalamazoo, Michigan.
Mrs. A. I. Wallace, wife of A. I. Wallace, A. B. Stove Co., Chicago.
C. N. Chubb and son, Pres. Iowa Nevada Light & Power Co., Des Moines, Ia.
S. W. Meals and daughter, Pres. Carnegie Natural Gas Co., Pittsburg, Pa.
J. S. DeHart, Pres. Isabell Porter Co., Newark, N. J.
O. H. Fogg, V. P. Consolidated Gas Co.; Pres., American Gas Association, New York City, N. Y.
Alexander Forward, Managing Director, American Gas Association.
R. C. Griswold, Chief Technician, Cities Service Co., New York City, N. Y.
K. R. Boyes, Sec'y, American Gas Association.
H. L. Whitelaw, V. P. American Gas Products Corp., New York City, N. Y.
Floyd Parsons, Editorial Director, Gas-Age Record, New York City, N. Y.
H. E. Bates, Asst. Chief Engr. Peoples Gas Light & Coke Co., Chicago, Ill.
Samuel Insull, Jr., Pres. Midland Utilities Co., Chicago, Ill.
B. J. Mullaney, V. P., Peoples Gas Light & Coke Co., and V. P. American Gas Association, Chicago, Ill.
W. A. Sauer, V. P., Peoples Gas Light & Coke Company, Chicago, Ill.
A. E. Robertson, Western Gas Construction Co., Ft. Wayne, Ind.
C. A. Munroe, Pres. Northern Utilities Company, Chicago, Ill.
S. G. Krake, Pres., American Gas Journal, New York City, N. Y.
C. J. Smith, Koppers Co., Pittsburgh, Pa.
F. H. Payne, Mgr., Metric Metal Works, Erie, Pa.
K. L. Simons, V. P. and Gen Mgr., El Paso Gas Co., El Paso, Texas.
J. E. Davies, Gen. Mgr., Peoples Gas Stores, Chicago, Ill.
Mrs. J. E. Davies, Chicago, Ill.
Henry C. Morris, Pres., Dallas Gas Co., Dalles. Tex.
F. C. Freeman, Providence Gas Company, Providence, R. I.
E. P. Millikan, Geo. M. Clark Company, Chicago, Ill.
C. N. Chubb, Pres. Iowa-Nebraska Light & Power Co., Lincoln, Neb.
H. E. Weeks, Treas. People's Light Company, Davenport, Iowa.
Clare N. Stannard, V. P. Public Serv. Co. of Colo., Denver, Colo.
J. L. Conover, Auditor Public Service & Gas Company, Newark, N. J.

MERCHANDISE SALES OF SOUTHERN COUNTIES EXCEED QUOTA

Merchandise sales by the sales force of the Southern Counties Gas Company for the year 1928 totaled slightly more than $689,000 as compared with a quota for the year of $550,000 according to an announcement by Clyde H. Potter, general commercial agent for the company. Sales for 1927 were $421,000. Sales in 1926 were $330,000. The sales quotas fixed for the various districts of the company for 1929 total $880,000.

W. W. HUSTED IS PRESIDENT OF LARAMIE GAS CO.

W. W. Husted, who has been connected with the St. Joseph Gas Company, St. Joseph, Missouri, for the past 10 years as superintendent of production and safety advisor, left about the middle of January for Laramie, Wyoming, where he assumed the duties of president and general manager of the Laramie Gas Company.

J. L. STONE CONCLUDES YEAR OF SERVICE TO C. OF C.

Concluding a year of service as president of the Spokane, Washington, Chamber of Commerce, James L. Stone vice-president and general manager of the Spokane Gas and Fuel Company, delivered an address on the occasion of the annual radio dinner of the chamber on January 16, 1929, which was broadcast over KHQ.

THREE COLORADO TOWNS GRANT NATURAL FRANCHISES

La Junta, Rockford, and Swink, Colorado, have granted franchises for the service of natural gas to those communities. Gas will be piped from the Denver-Amarillo line, the work to be completed by summer, according to announcement by the Public Utilities Consolidated Corporation, holder of the franchise.

Activity Seen *on* 1929 Gas Horizon *in the* West; Last Year's Expansion Reviewed

IN the paragraphs below WESTERN GAS summarizes the highlights in the 1928 development of a number of western gas utilities. Budget appropriations and expansion plans for 1929 are also presented in many instances.—EDITOR.

NATURAL GAS FOR P. G. AND E.—1928 EXPANSION REVIEWED

THE bringing of natural gas to northern California, already assuming concrete form as construction of the pipeline begins this month, opens another period of expansion for the gas industry in the territory served by the Pacific Gas and Electric Company. On another page of this issue the details of the P. G. and E. natural gas project are given in full.

Keeping pace with general activity on the Pacific Coast, the same utility has carried out a gas development program during the past 12 months costing approximately $4,400,000. The largest single item was the laying of 16-inch high-pressure gas transmission line from the Potrero Gas Plant in San Francisco to Lomita Park in San Mateo county, a distance of 16 miles. This work cost $465,000. In the East Bay Division, high-pressure mains were extended from Hayward to the towns of Decoto, Niles, Centerville, Alvarado, Newark and Irvington. This line was constructed at a total cost of $175,000. The Marysville-Oroville high-pressure line was extended to Chico, a distance of 22 miles, and an eight-inch high-pressure main was laid from the Marysville gas plant across the Feather River to the Oroville-Chico transmission line. This work cost approximately $205,000. One hundred and eighty-three miles of gas distribution lines were constructed by the company during the year.

Total gas sales for the year 1928 were 21,058,396.7 M. c. f., showing a gain of nearly 1,000,000 M. c. f. over the previous year. Independent meters to the number of 13,500 were installed, bringing the total number of gas meters in the P. G. and E. system to 466,628.

Gas appliance sales showed the benefit of a definite sales promotion program in districts outside San Francisco and the East Bay. Gas range sales amounted to 1650, water heater sales to 3200, space heater sales to 3900 and furnace sales to 1650.

Additional purification equipment was installed at the Potrero Gas Plant in San Francisco, and in the Oakland and Sacramento gas plants, at a cost of $175,000. At Stockton a gas holder was rebuilt at a cost of $180,000. New boilers and a 100,000 cubic foot gas holder were installed at Grass Valley, costing $65,000. Improvements were made to the San Jose, Redding and Marysville plants, amounting to $100,000 in cost.

During the year the company spent or authorized $1,000,000 for new buildings and other improvements on its system. This included $45,000 for a new office building at Auburn, $32,000 for reconstruction of the Stockton office, and over $800,000 for construction of a new service group for the San Francisco Division, at Eighteenth and Folsom streets.

Approximately $4,000,000 will go into gas system additions for the P. G. and E. in 1929, on top of the natural gas pipe lines project which occupies the chief place in the current year's development for this utility.

The engineering department of the Pacific Gas and Electric Company is working on plans for considerable plant extensions and additions in various parts of the territory which do not come within the scope of the projected natural gas developments.

For San Rafael, specifications are being drawn for two 250 H.P. motors, one 170,000 cu.ft. per hour steam compressor; and steam driven booster and after-cooler. In the same plant, work is already in progress on a double recirculating system for scrubbing which is being installed at a cost of $27.000, and additions to the liquid purification system totalling $9,000.

For the Vallejo plant a 9-foot, two-shell oil gas generator is planned, along with two generator blowers, primary and secondary scrubbers, lampblack mixing pumps, and a steam driven, low pressure booster. The new equipment is designed to give the Vallejo plant an added capacity of 800,000 cu. ft. per day.

Two new holders, one 500,000 cu. ft. for Marysville and one of 100,000 cu. ft. for Redding are also planned. Both of the holders will be of the water-seal type.

In Stockton, a 250 H.P. boiler and additions to the liquid purification system are being installed.

At Santa Rosa a variable speed motor-driven booster is being installed at a cost of $4,200.

An $8,000 bulkhead is being installed on the Petaluma property along the banks of the Petaluma Creek.

PACIFIC POWER & LIGHT CO. INCREASES SALES IN 1928

During 1928 the Pacific Power & Light Company of Portland, Oregon, reported an expenditure of $54,439.89 for additions and betterments to its gas distribution system. Total gas sales for the year were 190,762.5 M. c. f., and showed an increase of some 4,000 M. c. f. over 1927. Gas ranges to the number of 237 were hold, and 101 water heaters.

No appropriations have been made for additions and betterments for the year 1929, owing to the fact that the company has sold all gas properties to the Northwest Cities Gas Company.

INCREASE IN EXPENDITURES REPORTED AT SAN ANTONIO

AN increase of $240,345.00 in gross expenditures during 1928 over 1927 was reported by the San Antonio Public Service Company, of San Antonio, Texas. Expenditures for 1928 totaled $793,325.81. Sixty-one and one-half miles of gas distribution mains were laid, and 4,679 meters were installed. To date the company has 41,400 independent meters in the system. A substantial increase is reported in gas sales for the year. In 1927, 4,203,644 M. c. f. were sold, as compared with 4,962,021 in 1928.

Gas ranges to the number of 479, water heaters numbering 131, and space heaters totaling 634 were sold during 1928.

Gas main additions to the system costing $510,404.16 were made. Installing meters and regulators, and other expenditures totaled $181,500 over the 12 months period.

The 1929 budget for the company has not yet been approved, but several additions to plant, lines and general equipment are in project.

L. A. GAS AND ELEC. CORP. SETS $1,770,000 APPROPRIATION

ADDITIONS to the gas system of the Los Angeles Gas and Electric Corporation of Los Angeles, California, amounted to $1,770,312.10 during the year just closed. For maintenance the company expended $397,437.88 during 1928. Over 54 miles of gas distribution lines were laid during that period, and 12,834 independent meters were installed, bringing to total number of gas meters in the company's system to 370,013. Total gas sales for the past year showed a substantial increase, with 18,649,754 M. c. f. during 1928 as compared with 17,699,081 M. c. f. during 1927.

Some of the chief projects carried through in 1928 included the following:

Construction of a passenger elevator on the company's 15,000,000 cubic foot holder at Ducommun street, Los Angeles, (cost $19,800.)

Erection of pump house at the Aliso street gas works, and deepening of tar water pits at same plant.

Purchase of automobiles and trucks to the amount of $49,000.

Purchase of sites for district offices in Alhambra, Inglewood and Huntington Park, $113,000 in all.

An appropriation of $1,770,000 has been made for gas system additions and betterments during 1929, and expenditures will be confined principally to the gas distribution department. The company plans to lay 73 miles of distribution mains, install 9600 gas services, 1400 gas meters and 4.000 regulators.

Among other important items of the 1929 budget are appropriations to build the new district offices at Alhambra and Pasadena, California. The Pasadena office will be started early in the year, and will be built on the company's property facing Pasadena's new Civic Center.

SO. COUNTIES GAS CO. REPORTS EXCELLENT YEAR IN 1928

SOUTHERN Counties Gas Company, during the year ending November, 1928, expended $2,255,416 on additions and maintenance of the gas system. One hundred and eighty-four miles of distribution lines were laid, with one new community being served—that of Camarillo, during the past year. New meters to the number of

7,946 were installed, bringing the total number of meters in the system to 128,451.

The sale of appliances during the year took a decided advance over 1927. The number of gas ranges sold during 1928 was 3,841, or a gain of 725 over 1927. Water heaters showed a gain of 447 over 1927 with 1,557 sold during the past year. A gain of 1,158 in the sale of space heaters brings the 1928 total to 3,265. One hundred and eighty gas fired refrigerators were sold in 1928 as compared with eight in 1927. Furnaces to the number of 157 were sold, and special burners totaled 137.

Total gas sales for the year ending November 30, were 12,550,650 M. c. f., showing a gain of substantial proportions over the previous year, when gas sales totaled 11,637,619 M. c. f.

Appropriations totaling $1,500,000 have been made for additions to the Southern Counties Gas Company system during the year 1929.

B. C. ELEC. POWER & GAS CO. MAKE IMPORTANT ADDITIONS

A NUMBER of important additions were made to the British Columbia Electric Power & Gas Company's system during the fiscal year ending June 30, 1928. Seventy miles of lines were laid during the year; 4,277 independent meters were installed, raising the company's meter total to 36,651; 2 exhausters were constructed; 2 station meters and a tar extractor were built. The company expended $588,319 on additions and maintenance during 1928.

Gas equipment sales showed an encouraging total, with 1233 gas ranges, 503 water heaters, 1203 space heaters and 50 furnaces sold during the fiscal year.

Gas sales for the period totaled 1,030,081 M. c. f., showing a good gain over the 920,000 M. c. f. total for the fiscal year of 1927.

Among important additions to plant equipment in 1928 were two exhausters, two station meters, and a tar extractor.

A 1929 budget of $1,008,000 for gas system additions includes provision for a new water gas plant of two units with 3,500,000 cubic feet capacity; a waterless gas holder, 3,000,000 cubic feet capacity; four purifiers, 2,500,000 cubic feet capacity; 30-inch station governor; a sulphate of ammonia plant; and a booster.

APPLIANCE SALES OF NEBRASKA DISTRICT SHOW GAIN

Metropolitan Utilities District of Omaha, Nebraska, reports a successful year in the sale of gas equipment. Nine hundred and thirteen gas ranges were sold by the company during the year; 490 water haters, 113 space heaters, 127 furnaces, and 105 pieces of laundry apparatus. Bringing the District's total number of meters to 48,900, 368 new meters were installed, and 1,694,875.6 M. c. f. of gas were sold during 1928.

For additions and betterments during the year of 1929, the company has appropriated $75,000.

GREAT FALLS GAS CO. BRINGS NATURAL TO CITY IN 1928

Spending $330,000 in additions and betterments for the year 1928, the Great Falls Gas Company, of Great Falls, Montana, brought natural gas to the city to replace the manufactured gas formerly served. This amount represented a gain of $218,000 over 1927 expenditures. Three hundred and fifty-eight new meters were installed, bringing the total number to 4100 for the city. Six and one-half miles of distribution mains were laid in 1928.

Appliance sales kept pace with development along other lines, the following being the record of sales: Gas ranges, 390; water heaters, 276; space heatrers, 372; furnaces and conversion burners, 402; laundry equipment, 106, and special burners, 53.

CONSOLIDATED GAS UTILITIES SERVES NEW TOWNS IN 1928

Consolidated Gas Utilities of Oklahoma City, Oklahoma, has brought gas service to several communities during the year 1928. Okeene, Fairview, Hitchcock, Canton, Watonga, Fay, Thomas, and Custer City, all of Oklahoma, are among the communities receiving gas during the year.

A 169-mile 14-inch pipe line from Wheeler county, Texas, to Enid, Oklahoma, was built, representing the major development of the year. An eleven-mile 10-inch gas transmission line from Hunnewell, Kansas to Deer Creek, Oklahoma, was also constructed. Two 1750-h. p. compressor stations were built, one at Eagle City, the other at Carpenter, Oklahoma. A 750-h. p. compressor was built at Enid.

TUCSON GAS, ELECTRIC L. & P. CO. INSTALLS 500 METERS

Six miles of gas distribution lines were laid in 1928 by the Tucson Gas Electric Light and Power Company of Tucson, Arizona. Over 500 independent meters were installed by the company, and 144,191 M. c. f. of gas were sold, a gain of about 20,000 M. c. f. over the year previous.

Gas appliance sales totaled 296, and were divided as follows: Gas ranges, 148; water heaters, 104; space heaters, 42; and gas fired refrigerators, 2.

A dehydration plant handling 72 M. c. f. per hour was constructed, at a cost of approximately $22,000.

Twenty-five thousand dollars is the sum appropriated for additions to the system during 1929.

SPOKANE GAS AND FUEL CO. PLANS 1929 IMPROVEMENTS

Spokane Gas and Fuel Company of Spokane, Washington, has incorporated in its 1929 budget an appropriation for condensing coils for a high pressure distribution system and for a 110,000 cubic feet per hour capacity station meter, together with other additions and betterments.

Total expenditures for maintenance and additions to the company system for the year 1928 amounted to $48,316.71. Gas sales of 325,043 M. c. f. represent the total for the past year.

Sales of gas appliances for the year 1928 were divided as follows: Gas ranges, 862; water heaters, 595; space heaters, 85; gas refrigerators, 10; furnaces, 8; special burners and furnaces, 35; laundry apparatus, 35.

PUEBLO GAS & FUEL COMPANY REPORTS 1928 GAINS

Pueblo Gas & Fuel Company expended $268,959 in maintenance and additions to its gas system in 1928, an increase of some $48,000 over 1927. Gas sales to the amount of 139,079 M. c. f. were noted, showing a measurable increase over the 118,510 M. c. f. figure for the previous year. Over 800 independent meters were installed by the company during the past 12 months, bringing the total number of meters in the system to 4489. Over 12 miles of gas distribution mains were laid during the year.

Gas appliance sales were divided as follows: Gas ranges, 286; water heaters, 286; space heaters, 406; gas fired refrigerators, 10; furnaces and boilers, 65; laundry apparatus, 2. The company also made 303 conversions to gas from other types of furnaces.

KANSAS CITY GAS CO. FINDS 1928 GOOD SALES YEAR

KANSAS City Gas Company, of Kansas, City, Missouri, reports an upward curve in gas sales during 1928, 7,827,399 M. c. f. being sold, as compared with 5,089,018 M. c. f. during 1927. Bringing the total of meters in the system to 88,774, 2190 new meters were installed last year. Forty-five miles of gas distribution lines were laid. North Kansas City and suburban sections of Kansas City, Missouri, received gas service during 1928 from the company, which expended $897,321 during that period for maintenance and additions.

The sale of gas appliances in Kansas City showed gratifying results last year. Gas ranges totaling 4501 were sold; water heaters sales numbered 734; 1500 radiant type heaters were sold. Other types of space heaters to the number of 374 were sold, and over 800 furnaces. Gas-fired laundry apparatus found favor with Kansas City housewives, the company selling 325 pieces of this type of equipment.

HOUSTON PIPE LINE COMPANY COMPLETES GAS LINE

Houston Pipe Line Company, with headquarters at Houston, Texas, during the month of December completed construction work of a 12¾-inch welded gas line. Starting at a point along the company's main line, just east of Wharton, the line runs in a general direction south to the plant of the Texas Gulf Sulphur Company now under construction on Boling dome in Wharton County. This dome is described by geologists as one of the world's greatest sulphur deposits.

The Texas Gulf Sulphur Company has installed a plant embodied in which are a number of innovations in sulphur mining and will provide in all fuel requirements for the use of natural gas which will be furnished by The Houston Pipe Line Company. The Pipe Line Company has also arranged to meet part of the requirements with gas produced by Sun Oil Company from wells on the San Bernard River, six miles east of Boling dome.

The pipe line construction work is under the direction of district foreman T. A. Chappel who will have charge of the operation and maintenance of that district of the pipe line company after Texas Gulf Sulphur Company starts production in the new plant.

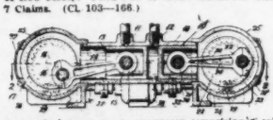
C. R. COLLINS ASKS PERMIT TO LAY SUBMERGED PIPE

Charles R. Collins, holder of the Kelso, Washington, gas franchise, has made application to the war department office at Portland, Oregon, for a permit to lay a submerged pipe across the lift span of the highway bridge over the Cowlits River at Kelso. The proposed work consists of a six-inch steel pipe attached to the piers 17 feet below low water. The purpose is to supply gas for domestic and industrial use.

Bremerton, Washington, voters recently granted Mr. Collins a franchise for the distribution of gas in that city, and money has been posted by him to insure the acceptance of the franchise in Kelso and in Bremerton.

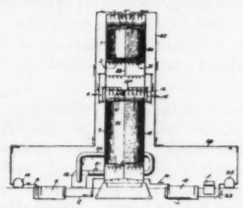
THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,689,419. VALVELESS PUMP OR COMPRESSOR. WILHELM B. BRONANDER, Montclair, N. J., assignor to American Machine & Foundry Company, a Corporation of New Jersey. Filed Feb 3, 1926. Serial No 85,643. 7 Claims. (Cl. 103—166.)



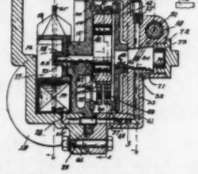
1. A valveless pump or compressor comprising a cylinder having an inlet port and an outlet port in its wall, two pistons working in said cylinder, and means for producing relative differential retreating movements of said pistons in the region of said inlet port to draw a charge into said cylinder, and relative differential approaching movements of said pistons in the region of said outlet port to expel a charge from said cylinder said means including two crankshafts one at either end of said cylinder a common drive for said crankshafts and operative connections.

1,690,438. RECIRCULATING PROCESS AND APPARATUS FOR GAS PURIFICATION. FREDERICK W SPEAR, Jr., Pittsburgh, Pa., assignor to The Koppers Company, Pittsburgh, Pa., a Corporation of Pennsylvania. Filed June 6, 1924, Serial No 718,255. Renewed Jan. 23, 1928. 11 Claims. (Cl. 23—225.)



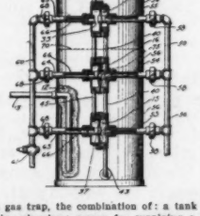
1. A process of the kind referred to for the purification of gases involving the steps of washing gas with a liquor to absorb impurities, aerating such wash liquor to regenerate the same and washing the air to remove the impurities, characterized by recirculating the air from which the impurities have been removed back to the liquid regeneration stage.

1,691,687. PIPE-LINE SAMPLING DEVICE. JOHN S. WATTS, Los Angeles, Calif. Filed Dec 7, 1925. Serial No 73,715. 7 Claims. (Cl. 73—21.)



1. In an organization of the general character described, a main member interposable in a pipe line through which a fluid is advancing under pressure, said member providing a main passage, with which a subsidiary passage communicates, and a completely closed rotor chamber, said passages and chambers having walls adapting them to resist internal pressure; a revolving rotor in said chamber, operated by the main stream of fluid passing through the pipe line; and means, driven by said rotor, for causing successive unit quantities of fluid to advance through said subsidiary passage.

1,691,350. GAS TRAP. FORD W HARRIS, Los Angeles, Calif. Filed Jan. 18, 1927. Serial No 161,841. 7 Claims. (Cl. 183—2.7.)

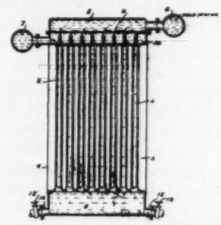


3. In a gas trap, the combination of: a tank providing a separating chamber; means for supplying a gas-liquid mixture to said separating chamber; a plurality of valve structures placed at different heights, each of said valve constructions consisting of a gas chamber, a liquid chamber, a diaphragm forming a common wall for said chambers, a gas port for said gas chamber, a liquid port for said liquid chamber, a gas valve carrier by said diaphragm for closing said gas port, and a liquid valve carried by said diaphragm for closing said liquid port; means for connecting said gas chambers to the gas end of said separating chamber; means for connecting said liquid chambers to the liquid end of said separating chamber; a plurality of liquid flow tubes, one of said liquid flow tubes being connected to each of said liquid ports, said liquid tubes having different sized openings; and a plurality of gas flow tubes, one of said gas flow tubes being connected to each of said gas ports, said gas flow tubes having different sized openings.

1,689,671. TURBO AIR OR GAS COMPRESSOR. ALEXANDER JUDS, Birmingham, England, assignor to Bellias and Morcom Limited, Birmingham, England, a British Company. Filed Apr 9, 1927, Serial Nos 182,263, and in Great Britain May 31, 1926. 5 Claims. (Cl 230—209.)

1 In a turbo gas compressor, a casing formed with an outer water cooling chamber, a plurality of impellers in said casing, said casing being formed with a diffuser and a return channel leading from one said impeller to the next impeller, walls of said return channel separating said outer water chamber from an inner water cooling chamber between said diffuser and said return channel, and approximately radial webs formed with approximately radial passages communicating with said outer and inner water chambers interconnecting said walls

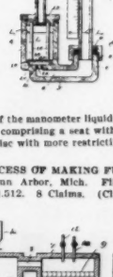
1,689,927. PROCESS OF AND APPARATUS FOR TRANSFERRING HEAT. HAT C NEWHOUSE, Wauwatosa, Wis. Filed Dec 14, 1923. Serial No. 680,578. 6 Claims. (Cl. 257—254.)



1 The process of utilizing gases of combustion to heat fluid having an initial temperature below the dew point temperature of the gases, which comprises, producing a stream of the fluid having oppositely flowing adjacent portions at least one of which has gradually decreasing velocity, initially raising the temperature of one of said stream portions to at least the dew point temperature of the gases by transfer of heat from said gases through the other of said stream portions, and subsequently heating the fluid from said initially heated stream portion by direct transmission of heat from said gases

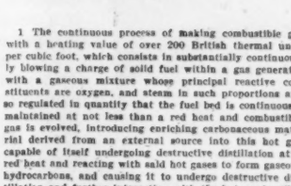
1,680,776. FLOW METER. CLARENCE A DAWLEY, Plainfield, N. J. Filed Apr 4, 1924. Serial No. 704,243. 4 Claims. (Cl. 73—167.)

1. In a fluid metering system, head producing means, a liquid manometer for showing head connected to said means, and a check valve restricting downward motion of the manometer liquid to a certain degree and restricting



upward motion of the manometer liquid to a greater degree, said check valve comprising a seat with a restrictive opening and a light disc with more restrictive opening.

1,689,940. PROCESS OF MAKING FUEL GAS. ALFRED H WHITE, Ann Arbor, Mich. Filed Jan. 14, 1920. Serial No 351,512. 8 Claims. (Cl. 48—205.)

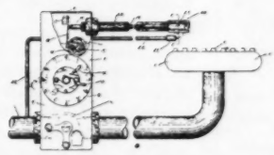


1 The continuous process of making combustible gas with a heating value of over 200 British thermal units per cubic foot, which consists in substantially continuously blowing a charge of solid fuel within a gas generator with a gaseous mixture whose principal reactive constituents are oxygen, and steam in such proportions and so regulated in quantity that the fuel bed is continuously maintained at not less than a red heat and combustible gas is evolved, introducing enriching carbonaceous material derived from an external source into this hot gas capable of itself undergoing destructive distillation at a red heat and reacting with said hot gases to form gaseous hydrocarbons, and causing it to undergo destructive distillation and further interaction with the hot combustible gas out of contact with metallic surfaces and at temperatures which decrease slowly and are maintained principally by the energy resulting from the reactions in the fuel charge in the generator, whereby substantial destructive decomposition into free carbon of the hydrocarbons so formed is avoided.

1,690,105. GAS BOILER. EDWARD R. DOWNE, Larchmont, N. Y., assignor to American Radiator Company, New York, N. Y., a Corporation of New Jersey. Filed Sept 30, 1925. Serial No. 59,442. 10 Claims. (Cl 122—225.)

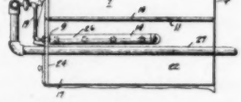
1. A boiler of the character described comprising a plurality of water containing sections forming flues therebetween, and a plurality of relatively small tapering projections distributed over the opposing walls of said flues and extending into the path of the hot gases and products of combustion passing therethrough, and serving to divide each flue into a series of uninterrupted vertical passages, each of whose area in cross-section is relatively wide at its intermediate portion and tapering towards the opposite ends thereof and in which the ratio of a rectangular area of said flue wall whose sides are tangent to the outermost rows of projections, together with the area of its said projections, is about 1.83 times the area of the corresponding rectangular area of inner wall surface, substantially as specified

1,678,130. TIME-CONTROLLED GAS-BURNING APPARATUS. VICTOR M TYLER, New Haven, Conn., assignor to The Sentinel Mfg. Co., New Haven, Conn., a Corporation. Filed Nov 23, 1926. Serial No 150,234. 2 Claims. (Cl 67—87.)



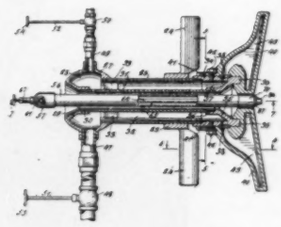
1 In a time-controlled gas-burning apparatus, the combination with a gas burner, of a pilot-light jet therefor, a timing-mechanism constructed and arranged to automatically turn on the supply of gas to the said burner, a yielding stop-member exerting a constant effort to engage a running part of the said timing-mechanism; and a thermostat constructed and arranged to normally hold the said stop-member out of engagement with the timing-mechanism and located adjacent to the said pilot-light jet, so as to be affected by the heat developed thereby, whereby, when the pilot-light becomes extinguished, the automatic turning-on of the gas by the said timing-mechanism will be forestalled and prevented.

1,690,290. GAS-KINDLING-BURNER INSTALLATION. FREDERICK A. GERICH, Oakland, Calif., assignor to Hammer-Bray Company, Oakland, Calif., a Corporation of California. Filed July 26, 1926. Serial No. 125,071. 7 Claims. (Cl 126—96.)



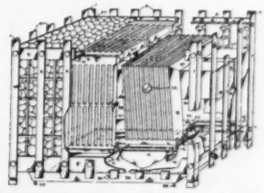
1 In a stove provided with a cooking top, a fire box and a top gas burner chamber underlying said top, gas burners in said chamber, a kindler burner arranged to deliver gaseous fuel within said fire box, a gas supply manifold at the front of said stove, and supply cocks for all said burners operatively disposed between said manifold and burners and having corresponding parts thereof in rectilinear alignment

1,678,086. GAS BURNER. HAROLD D. SCHRADER, Denver, Colo. Filed Oct. 25, 1926. Serial No. 143,945. 6 Claims. (Cl. 158—99.)



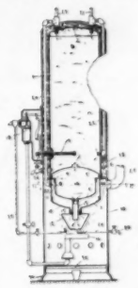
1. A gas burner comprising a hollow body member having a mixing chamber and two axially aligned openings, one of which is of greater diameter than the other, a pipe secured to the side of the opening having the larger diameter, said pipe extending outwardly from said body member, a second pipe, whose exterior diameter is smaller than the interior diameter of the first mentioned pipe located within the latter, one end of said smaller pipe extending through the mixing chamber and threadedly connected with the wall of the smaller opening, a hub member having a central opening and an annular chamber concentric therewith, the outer wall of the annular chamber being connected with the larger pipe and the inner wall of said annular chamber being connected with the smaller pipe, whereby the annular chamber is put into communication with the mixing chamber through the annular cylindrical space between the pipes and a plurality of hollow burner arms secured to the hub member and having their interiors in communication with the annular space in the hub.

1,681,484. GAS HEATER. WALTER KENNEDY, Clifside N J. Filed Jan 29, 1925, Serial No. 5,447. Renewed Jan. 16, 1928. 8 Claims. (Cl 126—92.)



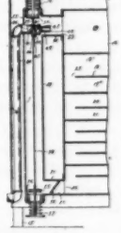
1 In a heater of the class described, an outer open-work container, material simulating fuel within and at the top and front of said container, and a burner at the bottom and behind said material, and radiants behind said material and higher than said burner

1,681,377. STORAGE WATER HEATER. ELMER S STACK, Somerville, Mass. Filed Oct. 29, 1921. Serial No 509,087. 8 Claims. (Cl 122—18.)



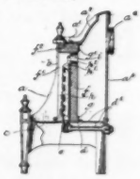
1 A water heater comprising a tank having a bottom head, a heating chamber depending from said bottom head in communication with the space enclosed by such head, and an inner partition crossing the interior of the tank above such head, said partition being constructed and arranged with a portion of its structure at a relatively high level, and another portion at a relatively low level forming a pocket for collection of sediment, and having an opening in said portion at the relatively high level for passage of water into the space between itself and the bottom head, and a tap leading from said pocket.

1,685,819. SAFETY DEVICE FOR GAS-RADIATOR SYSTEMS. ELMER E LEDGETTER, Detroit, Mich., assignor to The Ever Hot Heater Company, Detroit, Mich., a Corporation of Michigan. Filed Apr. 11, 1927. Serial No. 182,846. 9 Claims. (Cl 126—91.)



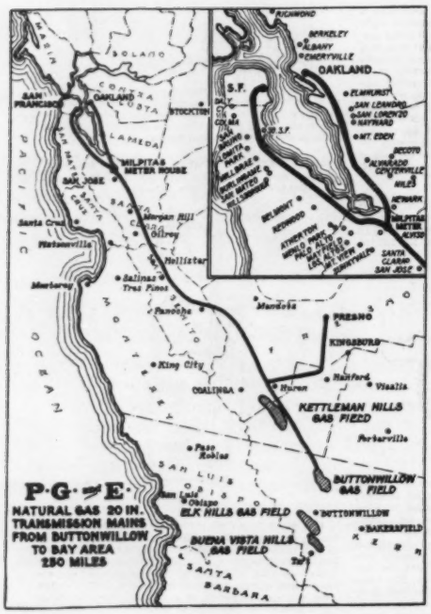
1. In an internal combustion radiator heating system, the combination with a combustion chamber having a fuel inlet and an air inlet, of means for forcibly withdrawing the products of combustion through the combustion chamber, and means operable upon a predetermined lessening of the circulation through said combustion chamber for automatically closing said air inlet

1,686,358. GAS HEATER. AARON H. WOLFF, New York, N. Y. Filed July 26, 1923. Serial No. 653,884. 9 Claims. (Cl. 126—92.)



1. A gas heater embodying therein a casing having an opening in the front thereof, combustion chamber forming means having a forwardly directed top, and a back wall rearwardly of said opening, a plurality of burners, opening into the bottom of said combustion chamber, a radiant element above each of said burners and extending adjacent the top of said combustion chamber, and a back plate for said casing spaced sufficiently away from the back wall of said combustion chamber forming means to form a flue chamber rearwardly of said combustion chamber, said back plate having an opening therethrough adapted to receive a flue pipe, and said combustion chamber forming means having an opening through the back wall thereof adjacent the top of each radiant element whereby gases will flow from said combustion chamber and through said flue chamber and the opening therein.

Natural Gas *for* San Francisco *by* August 1, 1929



NATURAL gas will be in the San Francisco Bay area by August 1.

This was the announcement made on January 31 by A. F. Hockenbeamer, president of the Pacific Gas and Electric Company. He had just negotiated a contract for laying the first section of a giant pipeline which will bring gas from the San Joaquin Valley oil fields to San Francisco, San Jose, Oakland and adjacent territory. Over $13,000,000 will be invested in the enterprise.

The main pipeline will be 250 miles long. Pipe for the first 60 miles has already been manufactured by the A. O. Smith Corporation in Milwaukee and is now en route to California in train loads running at express speed. A wire from the Smith Corporation yesterday read:

"One hundred and thirty-two cars of pipe, making two solid train loads of 66 cars each, left Monday morning with double header engines, carrying the banner 'California here we come.'"

The first train load was due to arrive in Oakland on February 3, and be at once routed to Tres Pinos in San Benito county were workmen and ditching machines are stationed. A train load will follow every day thereafter until the full shipment has been completed.

Work on the first section of the pipe line will begin at Tres Pinos on Monday morning, the ditching crews working east through the Panoche Pass into Fresno county at the rate of two miles a day.

Plans for the pipe line call for a 16-inch main from the Buttonwillow gas field near Taft in Kern county to Kettleman Hills, California's latest major gas field. From Kettleman the line will be 22 inches in diameter to Mendota in Fresno county. There, it will reduce to 20 inches and will turn west through Panoche Pass to Tres Pinos and then run by way of Hollister, Gilroy and San Jose to Milpitas.

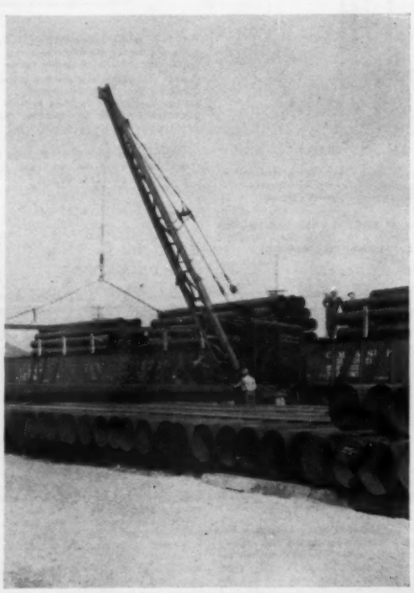
At Milpitas a metering station will be established from which two branches will take off, one to San Francisco and the other to Oakland, Alameda, Berkeley and Richmond.

The entire line will be welded throughout and will form practically a continuous tube without joints from the oil fields to the Bay area. The pipe for the branch from Milpitas to Oakland will be manufactured at the plant of the Western Pipe and Steel Company in South San Francisco.

Fresno will be supplied through an eight-inch branch, which will leave the main line at Huron and run 40 miles across the floor of the San Joaquin Valley. Including this branch and the branch from Milpitas to Oakland, the total amount of pipe to be laid will be 282 miles and will fill more than 1800 cars or 30 trains of 60 cars each.

A new gas holder of ten million cubic feet capacity will be erected in San Francisco and one of eight million cubic feet in Oakland, increasing storage facilities in the two cities to more than 60 million cubic feet.

Gas will be delivered to the pipeline in the Buttonwillow and Kettleman fields at a pressure of 400 pounds. This pressure will be reduced en route so that the gas will arrive in San Francisco and Oakland at a pressure of 50 pounds. Long term contracts already made assure an amply supply of gas for a term of years. It is expected that use will increase rapidly. As soon as the demand warrants, a large compressor plant will be erected near the Kettleman Hills to add to the supply. Later a booster station will be constructed between Kettleman Hills and San Jose, which will give the line an ultimate capacity of at least 125 million cubic feet per day.



Arrival and unloading of first shipments of 20-inch pipe to be laid under Bay Shore Highway out of San Francisco as a part of the natural gas project

Experts predict that the Kettleman Hills will prove one of the greatest gas fields yet discovered in California. Several thousand acres have already been proven and one well alone, owned by the Milham Exploration Company, produces something like 45 million cubic feet of gas per day. Fifteen additional wells are being drilled in the Kettleman field by the Standard Oil, the Ohio Oil, the General Petroleum Company and others. In the Buttonwillow field, seven wells have already been drilled and capped awaiting completion of the pipeline.

In making announcement of the beginning of construction on the line, President Hockenbeamer pointed out the importance of natural gas to both industrial and domestic consumers. The P. G. and E. itself plans to use large quantities of the new fuel in its steam electric generation stations in San Francisco and Oakland, including a new steam plant about to be erected in San Francisco.

Household users will be served mixed gas, but large industries on the pipe line route, which passes through principal industrial areas of the centers to be served, will be supplied straight natural gas. Low rates will be available for industry, especially for the off-peak load, and the result will be a tremendous increase in the industrial use of gas in northern California, where much progress in this field has already been made on artificial gas.

Gas of 700 B. t. u. will be distributed to domestic users in place of 550 B. t. u. gas now served, and this increased heating value together with rate adjustments to be made is expected to effect a rate saving to domestic users of some $3,000,000 a year in the Bay region.

SOUTHERN COUNTIES GAS CO. EXPANDS QUARTERS

Steady increase in the business of the Southern Counties Gas Company has made necessary expanded office facilities in the general headquarters of the company at 810 South Flower street. The Department of Public Relations and Sales, headed by Vice President F. H. Bivens, has moved from offices on the sixth floor to more commodious quarters on the seventh floor. Executive personnel included in the move are Cylde H. Potter, general commercial agent; R. M. Ranyard, claim agent; C. L. Ferry, power engineer and Walter D. Thurber, manager of the Department of Advertising and Publicity. Mr. Bivens' offices are in rooms 714 and 715 with the offices of his staff executives located on both sides of his suite.

NATURAL GASOLINE ASS'N. TO MEET IN TULSA, MAY 21-22

The board of directors of the Natural Gasoline Association of America at a recent meeting set the date for the annual convention of the association as May 21 and 22. The meet will be held at the Mayo Hotel in Tulsa, Okla., and the following program committee has been appointed: E. L. Peck, Empire Oil & Refining Company; Emby Kaye, Skelly Oil Company; and F. E. Rice, Phillips Petroleum Company.

A plant operator's meeting is to be held on February 26th at Ranger, Texas, with Dr. E. R. Lederer, vice-president of the Texas Pacific Coal & Oil Co., of Fort Worth, in charge.

Natural gas men of the Southwest, gathered at Shreveport in annual convention

Second Annual Convention *of* Southwestern Gas Men Draws 350 *to* Shreveport

By CRAIG ESPY
Mid-Continent Manager, Western Gas

THE two-day meeting of the Southwest Division, Natural Gas Department of the American Gas Association, held at the Washington Hotel, Shreveport, January 14 and 15 drew a creditable registration of gas men, in the Southwest Division, recruited chiefly from the five states represented, Louisiana, Texas, Arkansas, Oklahoma and New Mexico. Three hundred and fifty attended the sessions.

Frank L. Chase of the Lone Star Gas Company presided, and his opening remarks to the assembled body developed a spirit of interest which prevailed at each meeting. The meeting was called to order promptly at 9:30 on the opening day. Following the invocation delivered by the Reverend James Owens of Shreveport, the chairman introduced the Honorable L. E. Thomas, Mayor of Shreveport, who gave the address of welcome to which W. M. Phillips, Shreveport attorney, responded. Mayor Thomas in welcoming the assembled gas men, attributed the rapid growth of Shreveport and the surrouding territory to the development of its natural resources headed by natural gas.

Following these introductory addresses, Mr. Chase read messages from several gas men prominently identified with the industry, who were unable to attend the Shreveport meeting. Messages were read from Oscar Fogg, prseident of the American Gas Association; Samuel Meals, chairman of the Natural Gas Department; Henry C. Morris, vice-chairman of the Department; N. C. McGowen, a past chairman of the Department and Archie W. Leonard, also a past chairman.

A. G. A. MESSAGE

Major Alexander Forward, managing director of the A. G. A. next appeared on the program, bringing a word of greeting from the American Gas Association. His message was highly complimentary to the work of the Southwest Division of the Natural Gas Department as well as to the Southwest itself.

Following this address the chairman departed from the routine of the program to introduce several who were present, among them E. J. Stephany of Pittsburgh, secretary of the Natural Gas Department; E. F. McKay, manager of the Oklahoma Utilities Association; Mrs. Louella M. Fisher, chairman of the Home Service Committee of the A. G. A.; Miss Lois Upshaw, advertising manager of the Dallas Gas Company; Ray E. Miller, newly appointed secretary of the Natural Gasoline Association of America; and William C. Grant, secretary of the Southwest Division of the Natural Gas Department.

R. J. Daugherty of the Empires Company of Bartlesville, next delivered an address on the "Development of the Natural Gas Industry," and was followed on the program by H. C. Meade of the New Orleans Public Service, Inc., who read a paper on "The Development of Sales of Industrial Gas and the Rate Necessary to Obtain the Business." This paper will be found on another page of this issue.

The first paper of the afternoon session was read by Chester L. May of the Community Natural Gas Company of Dallas, on "The Ideal Distribution Systems for Communities of 250 to 1500 meters." His paper was among the outstanding ones presented and dealt with practical design and operation practices for distribution systems.

A paper was next read by E. L. Rawlins of the U. S. Bureau of Mines at Bartlesville giving a "Review of Open Flow by Pressure Methods." His paper was followed by others dealing with the same subject which were prepared by Donald E. Fuellhart of Brokaw, Dixon, Garner & McKee of Shreveport, and C. P. Parsons of the Magnolia Petroleum Company. Lantern slides were used to illustrate Mr. Fuellhart's talk. Walter Reid, Consulting Natural Gas Engineer of Dallas, was also called upon for a discussion of this subject.

Interesting discussion resulted from a question box which was next presented, a majority of the questions dealing with the merchandising of appliances, whether the natural gas company should or should not merchandise and how best to merchandise. This was followed by a report of the Southwest Division. Secretary William C. Grant, who in addition to reporting on the activities of the Division, gave a bird's eye view on the growth of the gas industry in the Southwest, with particular reference to the growth in Texas.

On the evening of the first day a barbecue was given the visiting gas men by the Shreveport gas companies, followed by an athletic entertainment of wrestling at the Lousiana State Fair Grounds' Coliseum. The barbecue was also given at the fair grounds.

The papers read on the morning of the closing day were by Miss Lois Upshaw, advertising manager of the Dallas Gas Company, on "Gas Company Advertising"; Joe Zeppa, Arkansas Natural Gas Corporation, Shreveport, on the "Proper Classification of Accounts for Natural Gas Producing, Pipe Line and Distributing Companies"; and by H. C. Otis of the Arkansas Natural Gas Corporation on the "Proper Casing and Tubing of Wells." Following Miss Upshaw's able paper, several were called upon for additional remarks on gas company advertising. Keith Clevenger of the Empire Companies at Bartlesville, E. F. McKay, manager of the Oklahoma Utilities Association and Hugh M. Blain, director of the Louisiana-Mississippi Committee on Public Utility Information contributed to this discusssion. The paper prepared jointly by Joe Zeppa and E. N. Watkins, general auditor of the Arkansas Natural Gas Corporation, was read by the latter. Following the reading of the paper by Mr. Otis, J. H. Dunn of the Lone Star Gas Company was called upon for a paper on "Reclaiming Low Pressure Wells with Siphons," in which field he has done considerable research.

RESOLUTIONS

Several resolutions were presented and adopted by the gas men as the last item of business for the morning session. They included a resolution presented by H. L. Montgomery, manager of the Cities Service Gas Company, that the annual meeting of the

Natural Gas Department be continued and further that there be created within the Division technical and commercial committees charged with the duty of developing activities in this section to be tied in with the activities of the industry nationally. Another presented by Chester L. May of the Community Natural Gas Company of Dallas, recommended as deserving the attention and support of the entire organized industry, the research work being done on determining the capacity of natural gas wells without waste of gas. A resolution presented by William C. Grant commended the commercial sales education efforts of the American Gas Association to the favorable attention of the Southwest Division and through the Division to member companies. A further resolution suggested the creation of a committee to further the work toward uniformity in the classification of natural gas accounts. The last resolution extended thanks to the Palmer Corporation, the Arkansas Natural Gas Corporation and other local gas companies and individuals for their generous hospitality to the visiting gas men. It also extended appreciation to the press for its support.

The last session of the Convention was a joint meeting of the Louisiana section of the American Society of Mechanical Engineers and the Southwest Division of the Natural Gas Department presided over by Roy McGrew of the Standard Pipe Line Company.

The principal features of this meeting were the reading of a paper by P. McDonald Biddison of Monroe on the "Economic Problems of High Pressure Gas Transmission," and a moving picture showing the process of manufacturing seamless line pipe by the National Tube Company. Mr. Biddison's paper was read by J. L. Foster of the Lone Star Gas Company. Following discussion on this paper the convention was adjourned.

COMMITTEES

Committees in charge of this second successful gathering of the Southwest Division were as follows:

General Chairman, Henry C. Morris, Dallas.

Arrangements: N. C. McGowen, Shreveport, chairman; B. M. Mowery, Shreveport; D. R. McWilliams, Shreveport.

Papers: Elmer F. Schmidt, Dallas, chairman; Edward F. McKay, Oklahoma City; William C. Grant, Dallas.

"B. T. Utopian Club" New Employee Organization *of* Lone Star

By CRAIG ESPY

Mid-Continent Manager, Western Gas

THE Lone Star Gas Company, already known for a general spirit of friendliness existing among company employees and between employer and employee, has taken another step to advance this good understanding by organizing an employees' club, now known as B. T. Utopian Club.

While the organization springs entirely from the rank and file of the personnel of the Lone Star and subsidiary companies, it is sanctioned and actively backed by the officials and directors of the company, who have helped to make it possible through supplying club rooms, and matching dollar for dollar the amount of money raised by the club through membership dues of $1.00 per month.

The purpose and object of the club as set apart in its by-laws is to "promote cordiality among its members and to foster a loyal and co-operative spirit among the employees of the Community Natural Gas Company, the County Gas Company, Dallas Gas Company, Municipal Gas Company and Lone Star Gas Company; to provide and maintain club rooms for the use of its members; to promote social, athletic and educational activities; to create a better understanding between employer and employee."

The club had its informal opening on November 21st, but for several months prior to this time it had been in actual process of organization. A mass meeting of employees held in May definitely decided that the club should be formed, and resulted in the appointment of a club committee which formulated the actual plans for the organization and popularized the idea and ideals of the club among the employees in the five companies through mass meetings and through a series of eight letters addressed to the employees, sent out under the name "The Clubber."

There are seven on the board of directors of the club, one elected by popular vote from each company represented and two appointed by the directors of the parent company. Each employee has the privilege of casting one vote, but can only cast his ballot for an employee in the same organization.

The Directors elected for the first year are: L. T. Schmid, County Gas Company; G. W. Martin, Dallas Gas Company; Roy Webb, Community Natural Gas Company; John L. White, Municipal Gas Company; J. A. Martin, Lone Star Gas Company; B. L. Rodgers and J. W. Martin were appointed to the directorate by the officials of the company. Club officers were to be elected by the directors from among themselves, resulting in the selection of B. L. Rodgers as president, G. W. Martin vice-president, J. A. Martin secretary, Roy Webb treasurer.

Two large, adjoining rooms on the 10th floor of the Lone Star Building in Dallas have been set apart for the club and have been attractively furnished by the House Committee. An advance of $1000 from the company made this possible.

To settle the matter of a name for the club a contest was decided upon, with a premium of the first year's dues offered the member who turned in the name that was selected. The contest brought in more than 100 suggested names. Each official of the companies represented, was given a duplicate set of the names from which he made a choice of one. These were turned to the President of the Lone Star, L. B. Denning, and a final count favored the name "B. T. Utopian," which had been turned in by J. A. Martin. Mr. Martin, who is secretary of the newly-formed club, instead of accepting the prize, requested that the $12 be applied on the radio fund.

A definite entertainment, educational, and athletic program is being developed.

More than 50 per cent of the local employees of the five companies signed up for charter memberships in the club, and the list of the members is rapidly increasing.

FRED DOYLE WITH P. G. AND E. IN NATURAL GAS POST

FRED F. DOYLE, formerly general field superintendent of the Midway Gas Company, and more recently supervising engineer of the Southern California Gas Company, joined the engineering staff of the Pacific Gas and Electric Company, late in January. Mr. Doyle will handle the engineering work in connection with the new natural gas line which the Pacific Gas and Electric Company is constructing, the announcement of which is outlined elsewhere in this issue of *Western Gas.*

Fred H. Doyle

As early as 1912 Mr. Doyle was with the Kansas Natural Gas Company, leaving them to go with the Midway Gas Company in 1916, and automatically becoming affiliated with the Southern California Gas Company when it was consolidated with the Midway.

He has designed and laid many gas lines, and planned and superintended the installation of a number of compressor stations in his former capacities with other public utilities.

WARM AIR HEATING INSTITUTE FURNACE CHAPTER FORMED

The Furnace Manufacturers chapter of the Warm Air Heating Institute was founded at an organization meeting held in Los Angeles on Thursday, January 24. Officers of the new association are: J. A. Martin, proprietor of the Phillips Heating Company, president; C. M. Rodehamel, Hayes Furnace and Manufacturing Company, vice-president; E. M. Richardson, president of the Unit System of Heating and Manufacturing Company, treasurer; Geo. Finney, secretary; H. W. Biddle, attorney.

The purpose of the association, which is organized for a period of five years, is to better conditions in the gas heating industry by establishing uniform contracts, costs systems, and in other ways effecting standardization of approved practices.

As soon as the organization of the Furnace Manufacturers' chapter is completed, the Warm Air Heating Institute expects to organize chapters for valve and register manufacturers and other related lines.

Charter members of the Furnace Manufacturers chapter are: Pacific Gas Radiator Company, Pacific Gas Heating Company, Phillips Heating and Ventilating Company, Unit Furnace Company, Unit System of Heating and Manufacturing Company, Braasch Heating and Manufacturing Company, L. H. Freymuth, Jr., Andrews-Schroeder Heating Company, J. B. Smith Heating Company, and the Hayes Furnace and Manufacturing Company.

"Five-Thirty Club" Builds Able Speakers

By ELLIOTT TAYLOR
San Francisco Manager, Western Gas

TUCKED away in a quiet corner of the Pacific Gas and Electric Company's multi-lateral field of activities is an organization, conceived by employees, carried on by employees, and to which the officers and higher executives of that utility consider it a distinction to be invited as occasional guests. The Five-thirty Club is an organization consisting of 50 men employees of the P.G. and E. who, independent of any other educational work of the corporation, have been engaged for the past five years in the study of public speaking. Requisites for membership are only that the employee have satisfactorily completed a course of public speaking at a university, or the course offered by the club itself, and that there be a vacancy on the membership roster—50 is the absolute limit, and there are almost as many applicants waiting in line for places at the round table as there are members.

Dinner meetings of the club are held semi-monthly at 5:30, when various members, selected in rotation, deliver formal eight-minute speeches as well as two-minute impromptu talks, while the other members, through a system of grading, keep record of the "score" in forensics that the speaker achieves.

So that the veritible Demosthenes in the organization may not too entirely outstrip his less gifted fellows, the scoring is done on a handicap basis. Even those who are good must thus extend themselves to maintain their supremacy as far as the scores are concerned. Cards are distributed in advance of a speech, and on these the auditors register their individual opinion of the speaker's adherence to the rules of public speaking. The cards are turned in, unsigned, and handed over to the speaker.

Membership in the Five-thirty Club does not come to all who apply, even when there is a vacancy, for the neophyte must first go through the prescribed course of training in the fundamentals of the public address before he is permitted to try out on club members. Elementary classes have been formed under the direction of an instructor from the University of California. Those who show promise in this preliminary work are placed on the waiting list for the club proper. The small initiation fees and dues of the organization meet all of these expenses.

It has become a practice to invite as honor guests of the evening, various officers of the company. At the last meeting A. F. Hockenbeamer, president of the P. G. and E. was an invited guest and presented five prizes donated by himself to winners of the club speaking contests held over a period of several months.

The advantages of such an organization, both to the company and to the individuals are perhaps too numerous and too obvious to require mention. For the individual members it means opportunity to acquire, through practice, the knack of speaking coherently and concisely on an instant's notice. And for the company it means a reliable group of trained speakers able to think clearly and express those thoughts convincingly, whether the audience be two or two hundred.

The present officers of the club are: President, W. A. Worthington; secretary, L. N. Earnett and sergeant-at-arms, H. P. Bear.

Sales floor and offices of Washington Gas and Electric Company at Everett, Wash.

Washington G. *and* E. *in* New Everett Office

WASHINGTON Gas and Electric Company of Everett, Washington, has moved into the new building constructed for the company on Colby avenue. The new office is one-story brick store building, centrally located in the heart of the retail shopping district.

Half of the floor space is given over to a display room, in which are offered to the public view the latest models of gas-fired equipment. Domestic science demonstrations may be held in the display room, as connections have been placed for installing any equipment on display. The building is heated by a gas-fired steam boiler.

Business offices occupy the remainder of the building. The accounting department is separated from the display room by a counter, while the manager's office is enclosed in glass partitions.

Clarence E. Lasher has been manager for the Washington Gas and Electric Company in Everett since 1925, and was connected with the company in other capacities for several years before accepting that post.

SO. COUNTIES GAS CO. COOKING SCHOOL SERIES BEING STAGED

A SERIES of cooking schools is being arranged by the Southern Counties Gas Company in various cities throughout Southern California. The schools are being conducted under the auspices of the representative newspapers of the several cities. Included in the series are the following: Covina Argus School, at Covina, under the auspices of the Covina "Argus"; the Santa Ana Register School, under direction of the Santa Ana "Register"; the Tribune School at Fullerton, sponsored by the Fullerton "Tribune"; the Bulletin School at Anaheim, under the auspices of the Anaheim "Bulletin"; the Report School at Ontario, sponsored by the Ontario "Report"; and the News School at Orange under the direction of the Orange "Daily News." Other schools are planned for Whittier, El Monte, Ventura, San Pedro, Santa Monica, and Santa Barbara.

Each session of the Santa Ana Register School, already closed, was attended by approximately 2,000 women. Joseph Snyder, advertising manager of the "Register," arranged the attractive program for each of the four days. A two-hour cooking demonstration by Victoria Warner of the Tappan Stove Company was the feature of this program. On the last day of the Santa Ana School the crowd of women began to arrive shortly after eight o'clock, although the doors did not open until one-thirty. By noon the double line of waiting women reached entirely around the block.

AMERICAN METER COMPANY HAS NEW CATALOGUE

An attractive 182-page stiff cover catalogue has been compiled and edited by the American Meter Company, and is designated as "Catalogue G-1." The book is divided into five sections, which are:

Section I: Gas meters for domestic and industrial service.

Section II: (a) Diaphragms; (b) Meter connections; (c) Meter repair parts; (d) The use and care of consumers' meters.

Section III: Large volume measurement.

Section IV: Apparatus.

Section V: (a) Recording demand, indicating demand and empire limiting demand devices; (b) Demonstration and glazed exhibition meters.

Any *Western Gas* reader desiring a copy may secure one through the Pacific Meter Works, 495 Eleventh street, San Francisco.

"FROM INDIANS TO MODERNS" IS L.A.G. AND E. BOOKLET

"From Indians to Moderns" is the title of a booklet recently published by the Los Angeles Gas and Electric Corporation, of Los Angeles, California.

The pamphlet deals with the growth and development of the city from the village which the Indians called "Yang-na" to the present day metropolis of nearly 2,000,000 population. The history of the Los Angeles Gas Company, which later became the Los Angeles Gas and Electric Corporation, is told briefly, illustrated with comprehensive photographs.

The Trend *in* Domestic Sales

By L. J. BRUNDIGE

Pacific Gas and Electric Company

FOLLOWING IS THE concluding section of the Pacific Coast Gas Association Domestic Gas Sales Committee's 1928 report, publication of which was begun in the December, 1928, issue of WESTERN GAS. Mr. Brundige served as chairman of the Domestic Gas Sales Committee last year.

—EDITOR.

NO analysis of domestic gas sales would be complete without giving some consideration to competitive appliance sales. The superiority of gas as a fuel for cooking and water heating purposes over wood and coal and oil is generally accepted. Our study of the saturation of the appliance field indicated that no gas was used in 15 per cent of the homes located on gas mains. As a rule this group of consumers is made up of people belonging to the past generation who have not as yet given up the old wood and coal stove or former consumers who have adopted electricity as a domestic fuel.

Electric Range Sales Increase: The rapid increase in the sale of electric ranges during the past few years cannot be overlooked. Although it is true that a majority of the electric ranges now being sold are in suburban territory where gas is not available, the continuous sale and use of these appliances in territory immediately adjacent to towns and cities is bound to result sooner or later in a general movement towards the use of electric ranges in all territories. It does not seem logical that electric ranges could only be sold in suburban territory where people as a rule do not demand the convenience of modern life as do those residing in cities and towns.

Very few housewives today purchase gas ranges selling for around $200.00 without first investigating the possibilities of electric cooking and the reason why they do not always purchase an electric range is not because they believe it unsatisfactory. In fact there seems to be an inborn desire on the housewife's part to own an electric range—a desire created primarily by the many uses to which electricity has been satisfactorily applied. It is true that electric range advertising has been superior to gas range advertising from a physiological viewpoint, but the limited extent to which it has been used could not have brought about this widespread desire on the part of the public to own an electric range.

Some twenty years ago the first electric automobile was placed on the market and a great future was predicted. This prediction was largely based on the reputation of electricity as a means of solving all problems involving motive power. Yet what has happened? The gasoline engine manufacturers have made so many improvements in their product that the electric automobile today is a rarity and is not even considered as competition with the modern gasoline-driven automobile. What would have happened had the automobile man continued to sell his 1910 gasoline buggy? Can the gas man repeat the success of the gasoline engine manufacturer?

Difference in Sales Methods: A comparison of the two appliances—a gas range and an electric range, does not indicate that there are any advantages to be gained through the installation of an electric range. The question resolves itself, then, into a comparison of selling methods. The sale of electric ranges has always gone hand in hand with quality. A comparatively high price is asked for the equipment and obtained through emphasis on the cooking service that the appliance will give. Contrast this to the sale of gas ranges which, having become more or less in general demand, have been rated as a commodity to be sold by anybody and everybody for the profit which might be obtained through their sale, without regard to the quality of the appliance sold and without any particular emphasis on the class of service which the purchaser might expect to obtain from the appliance.

The electric range salesman from the beginning has found it necessary to sell scientific cooking methods along with his appliance, since the electric range required intelligent operation in order to operate satisfactorily and economically. Cooking by time and temperature originated with the electric range and still remains a distinctive selling feature.

The gas range industry has its past record to live down; the electric range business has started with a clean slate and promises to succeed unless a change is made in many current gas appliance merchandising practices.

MERCHANDISING POLICIES

The trend in domestic gas sales is directly affected by the merchandising policy of the serving company. There appears to be as many merchandising policies on the Pacific Coast as there are companies. We go from one extreme policy under which no gas appliances are sold by the gas company and very little dealer cooperation is given, to the other extreme which involves a plan of dealer cooperation together with an aggressive selling of gas appliances direct to consumers by the gas company.

These policies might be briefly classified as follows:

1. Aggressive direct sales activities with effective plan of dealer cooperation.
2. Aggressive direct sales activities—without dealer cooperation.
3. Dealer cooperation without direct sales by company.
4. No sales plan.

The necessity of adopting a merchandising policy which fits local conditions is unquestioned. Is it possible, though, that local conditions on the Pacific Coast vary to such an extent that all of these widely different merchandising policies can be the best that it is possible to obtain?

Dealer Cooperation: Several years ago the subject of dealer cooperation was discussed at a Pacific Coast Gas Association convention. At that time the plan of turning the entire merchandising activity of gas companies over to dealers was heralded as a new thought. Theoretically it appeared to be sound from every standpoint. Several companies on the Pacific Coast adopted the plan in its entirety. Other companies did not retire from the field of merchandising, but made some effort to increase the sale of gas appliances through other than their own outlets. Judging from articles and editorials appearing in eastern gas magazines it appears that the dealer cooperation plan of mercahndising is now being given consideration by eastern gas companies.

REAL COOPERATION

"Dealer Cooperation" has many interpretations. The "Simon Pure" dealer cooperation plan provides for the entire merchandising activity to be done by hardware stores, furniture stores, etc., with no direct selling on the part of the gas company. The plan of dealer cooperation, however, which appears to be coming into use more and more is the plan under which the gas companies continue to sell direct to their consumers on an ethical, businesslike basis, making it possible for dealers to continue in the gas appliance business.

After four or five years' experience with an exclusive plan of dealer cooperation under which all merchandising activities of the gas companies were turned over to dealers, it appears that certain phases of the dealer sales work have been inadequate.

The difficulty lies in the fact that most dealers are not interested directly in a load building activity and only sell gas appliances as a means of increasing their sales volume. The gas range is being sold by dealers merely as a commodity with no thought as to its value as a permanent load builder. The natural result has been that the quality of gas equipment has been gradually decreasing until the greater portion of the gas range business at the present time is being done on a price appeal. Inferior appliances do not build permanent load for the gas company on whose lines they are placed.

From time to time there has been agitation by the dealers to force gas companies out of the gas appliance business or prevent them from entering it. This agitation has been one of the principal objections to the direct sale of appliances by gas companies. An effort to hold the goodwill of the dealer has weakened the merchandising activity of some gas companies.

In the early part of this year a Joint Trades' Conference was held in the East for the purpose of discussing various merchandising problems. The conference was attended by representatives of the largest and most influential retail organizations in the United States, such as the National Hardware Association, Association of Electragists, National Retail Furniture Association, National Electric Light Association, representing power companies and manufacturers of electrical devices, and others. At the close of this conference a "Declaration of

Principles" was published which read in part:

> "Since the efforts of the Power Companies form the only continuous means of promoting the sale of electrical appliances, we believe the best interests of manufacturers, dealer and consumer, require the continuance of the merchandising activities of power companies."

This statement is followed by a set of principles which cover in general a code of ethics governing merchandising activities, such as margin of profit, price range, etc.

The merchandising problems of the electrical industry are parallel to those of the gas industry in many respects. This declaration will have a definite influence on the formulation of merchandising policies of gas companies.

Field and Store Selling: The continued sale of gas appliances through dealers must be recognized as being essential to the load building plan of any gas company. It is possible, however, for the gas company to adopt a plan of aggressive, direct selling, and at the same time retain and stimulate dealer outlets. One of the principal deficiencies in dealer merchandising has been the fact that their selling effort has been almost entirely confined to store selling. The successful retailer of specialty appliances for use in homes has found it necessary to direct his efforts particularly towards field selling. A natural division of the activity comes then in store selling and field selling.

It must be admitted that dealers have done a fairly good job in store selling insofar as gas appliances are concerned, but who will perform the field selling so essential to the success of our load building program? The average dealer operating a store is not properly organized to conduct intensive creative field selling. The gas company on the contrary is in a most advantageous position to do this work. Consumers of the gas company are already on their books as purchasers of its product. Through a properly planned sales program these consumers can easily be reached for the sale of quality gas appliances.

It is a proven fact that field selling by power company or gas company which is done on an ethical, business-like basis, not only increases the volume of load building appliances which are placed on the line through direct sale by the company, but also stimulates the sale of appliances through dealer outlets.

Active dealers carrying on aggressive selling campaigns will be able to capitalize on the gas company's efforts. It can not be said, however, that the weak, inactive dealer will benefit from an intensive direct-selling effort by the gas company since he will not be in a position to take advantage of the opportunity.

Gas Company Leadership Essential: It is essential that the gas company take a position of leadership both with regard to the selection of sales plans and the sale of quality gas appliances. If this is done the type of appliance connected to its mains can be controlled to some extent. The gas companies' sales activities will serve to educate the public to the advantages of better gas appliances, thus creating a demand for such appliances whether they be purchased from the gas company or the appliance dealer.

"Load-Building" the Objective: The principal objective of any gas company merchandising program is to build load. This objective cannot be successfully attained without enlisting the cooperation of the whole industry. Any group acting by itself, with a selfish motive in view, will only tend to nullify the efforts of others. With proper co-ordination, the gas appliance manufacturer, the gas company, and the appliance dealer can be made into a powerful load building organization which will result in maximum benefit to all concerned.

Summary:

In summarizing the domestic gas sales conditions on the Pacific Coast we might briefly say that the present trend in gas consumption per consumer is unfavorable and that this unfavorable trend appears to have been brought about:

First—Through lack of aggressive appliance sales effort on the part of gas companies; and

Second—A reduction in gas consumption per consumer as a result of a change in our habits of living.

A solution of this unfavorable trend lies in re-planning present gas merchandising policies to permit the intensive sale of gas appliances on a constructive, creative sales program.

Bringing Natural Gas *to* Denver Told *in* Motion Picture Film

IN conjunction with the bringing of natural gas from the Amarillo Fields in Texas, to Denver, the management of the Public Service Company of Colorado authorized the making of a moving picture as a part of the general publicity program, to graphically bring before the people a new story of service, stripped, as it were, of its technicalities and showing not only the magnitude of the project but its domestic and civic benefits as well as the solution of supplying a superior product with adequate supply. Allen B. Spencer of the company's publicity department directed the production of the film.

The complete film is 2100 feet long, divided into two reels and a trailer section, photographed in natural colors. It includes art titles and general finish such as may be found in any first class product of this nature. Actions were photographed in Denver, Colorado Springs, the Black Forest, Pueblo, and the neighboring country of Amarillo, Texas. The film generally is of the nature of a news reel and edited so that a part or the whole picture may be shown with interesting effect:

The action starts with a short introduction concerning man's first terror of fire, till he learned its control and consequent benefit, today exemplified in natural gas as a fuel. The first discovery well, in the Amarillo Fields, is followed by the country as it looked before the drilling. Then are shown scenes in the same country some years later, a mass of derricks, all bristling with action; the gas fields; the men who conceived the enterprise; an aeroplane trip over the country; the general method of laying the pipe line through all types of country; crews of workmen; ditching machines that do the work of some three hundred men; the coupler joints; parallel telephone lines; compressor stations to maintain the desired pressure; a comparative chart showing the reserve supply; a view of one of the wells which alone is capable of producing over eighty million cubic feet of gas per day, many times the amount required for Denver.

Next are shown some of the benefits which the city may enjoy; a smokeless skyline; the application of natural gas for industrial installations and its results; short playlette with a touch of humor, showing a young married couple who found their romance endeared at a correct time by using gas heat.

The picture is concluded with views of the personnel and organization behind the undertaking, including the service school, the service departments, and the executives of the company headed by Clare N. Stannard, vice-president and general manager.

The picture has had showings at some 18 neighborhood theatres, as well as many of the prominent luncheon clubs whose locations are such that the picture and equipment may be used to advantage.

CALIFORNIA R. R. COMMISSION IN IMPORTANT DECISION

The California Railroad Commission, in three decisions issued during January, authorizing the issuance of public utility stock, announced the policy that where such stock is sold to stockholders at par, when the market price of the stock is above par, the commission hereafter in fixing rates for such utilities will not regard the dividends paid on common stock in such instances as representing the real cost of money obtained through the sale of such stock, on the premise that if the stock were sold at the market price the cost of money to the utilities would be less, than under the plan of disposing of such stock to its stockholders at par.

METER REPAIR HANDBOOK IS READY FOR DISTRIBUTION

The Committee on Cooperation with Educational Institutions of the American Gas Association has published a pamphlet, "Instructions for the Care and Repairing of Gas Meters." Copies may be had for 25 cents from the American Gas Association, 420 Lexington Avenue, New York.

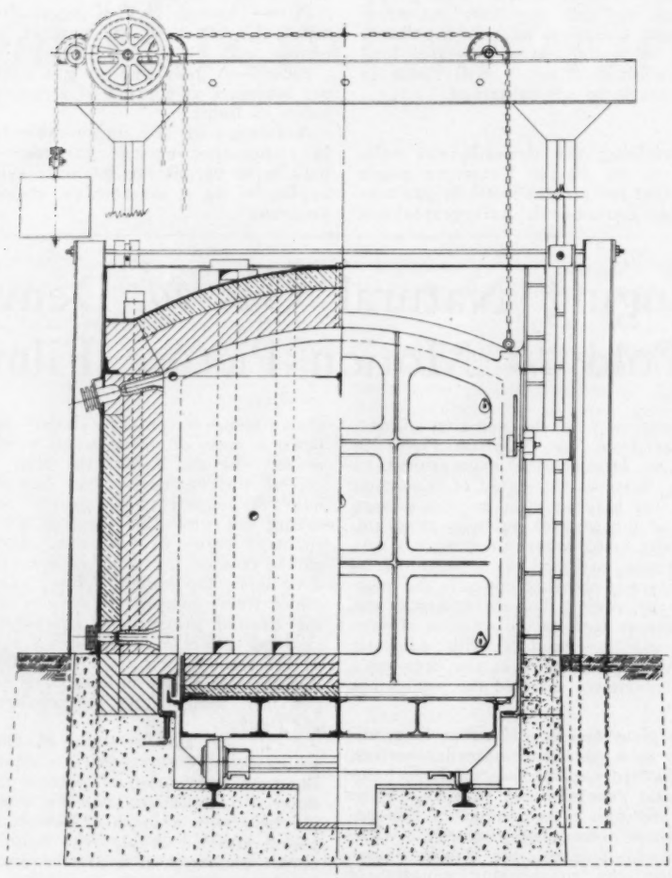
L. A. G. AND E. ORGANIZES L .A. FIRST AID CLUB

Present, past and future first-aid team members of the Los Angeles Gas and Electric Corporation have been organized into a club to be known as the L. A. Service First Aid Club. The organization meeting was held late in December, at which the following officers were elected: Vernon Taylor, president; James North, vice-president; Marvel Murray, secretary-treasurer.

The purpose of the organization is to simplify and clarify technical points in first-aid technique; to find better means for teaching methods of treatment by the illustrative plan; to form classes of employees' families for instruction; and promote a closer friendship between active team members.

A.G.A. NATURAL GAS DEPT. PROCEEDINGS OFF PRESS

Announcement has been made that the Proceedings of the 1928 annual convention of the Natural Gas Department of the American Gas Association is off the press, and may be obtained by writing the A.G.A. headquarters at 420 Lexington Avenue, New York. The price of the book is $2.50.



Sketch of car bottom annealing furnace—from Southern California Gas Company industrial booklet

Description and Size: Car Hearth—6′ 0″ wide x 8′ 0″ long, Door—6′ 0″ wide x 6′ 0″ high, Walls—9″ First Quality Fire Brick, 4½″ Silocel insulation, Steel shell and cast iron front.

Control: Automatic Indicating Controllers with Automatic Valves.

Operating Data—Erectors Test: Temperature range, 1200° to 2200° F.; Gas to Hold, 1800° F.=975 Cu. Ft. 1050 B.t.u. gas; Cubic feet of gas per 100 lbs. of product=125 approx.

Description of Process: Heat treating of steel and alloy steel castings and forgings of a type used in the oil industry.

Gas Serves *the* Metal Worker

(*Continued from Page 25*)

ducing atmosphere is maintained, reducing scale to the minimum. When one realizes that approximately 30 per cent of the present cost of machining of drop forgings is due to scale formed in forging, the value of this atmospheric control and the advantages of atmospheric control are at once apparent.

Whenever production allows, the use of a continuous type of furnace eliminates many of the difficulties encountered in heating operations.

Now to the particular installation under discussion:

There are four continuous forging furnaces in this installation identical in size and operation. Each has inclined, water cooled skid rails, pneumatic pusher, side-door discharge and is gas-fired using automatic water cooled burners. These furnaces are 18 ft. long and 4 ft. wide and 1½ ft. to spring line of arch, internal dimensions.

A forging temperature of 2200° F. is maintained, an air pressure of 1½ lbs. per square inch is used and natural gas is supplied at 1 lb. per square inch pressure. Each furnace will easily handle two tons of stock per hour with a heat cycle of 45 minutes. These units are automatic, for the pusher is so timed that the work is pushed through and discharged in the required period.

Automatic pyrometic controls maintain the temperature constant regardless of production. The firing equipment is of the automatic proportioning type whereby the atmosphere in the heating chamber is maintained slightly reducing. The combustion zones are so located that heat is applied to the work both top and bottom. This method of heating requires only about half the time to heat the work through, as compared with the slot type forge which heats only from the top. Furthermore, the outgoing flue gases preheat the incoming stock so that a high efficiency is maintained.

The writer saw these furnaces after they had been in steady operation for a year and the brick work looked as good as new—another advantage in use of a clean fuel.

Continuous Type Annealing Furnace Used in the Annealing of Gear Blanks

This furnace is of a semi-automatic type with two rows of trays and a single pusher. It is 24 feet long, with a preheat zone, a soaking zone and a cooling zone. The gear blanks enter the furnace at room temperature, reach 1500° F. in the soaking zone and are discharged at 1200° F.

Eight automatic low pressure inspirators fire into burner tunnels, four on each side of the heating zone. Air is supplied at 1½ lbs. and gas at normal pressure (8 oz.) and reduced to atmospheric pressure by the governor on the inspirator. The proper mixture of gas and air, always in the same proportion, is automatically maintained, regardless of pressure changes in the supply lines, and perfect combustion as well as a constant reducing atmosphere is constantly maintained. The automatic control lies in the air line. A recording controller operating a single 4-in. air valve automatically maintains the desired furnace temperature. (Fuel consumption, 750,000 B. t. u. per 100 lbs. gross work.)

Belt Conveyor Furnace for Continuous Automatic Heat Treatment of Small Parts

The furnace consists of a steel frame 4½-in. insulation and 4½-in. first quality fire brick. Its hearth (semi-muffle type) is 12 ft. long and 12 in. wide, fixed by automatic inpirator burners grouped as two units firing the heating and soaking zone of the furnace as separate units. Air is completely excluded from the furnace and a reducing atmosphere is constantly held. The furnace temperature is automatically maintained by automatic electric thermostat controls which control the air supply (controlling medium) to the burners.

One of the most interesting features of the furnace is the conveyor belt which is made from No. 16 or 18 gauge stainless steel. The material is 11¼ inches wide as purchased and in the shop is passed through a press which stamps close to each edge a series of closely placed tabs which are bent to 90° with the top surface of the belt. Perforating the belt in this manner has been found to prevent cracking of the edges and at the same time it provides a side and retaining wall which serves to keep the material within the limits of the bit. The loading space between the retaining walls measures 10¼ inches.

The belt is looped over two 18-in. pressed steel pulleys about 24 feet apart and the ends of the belt are riveted together with stainless steel rivets. Experience has shown that furnace conveyor belts constructed in this fashion have a long life and that failure invariably comes from a pulling of the joint rather than from cracking. It is to be expected that the belt will stretch from exposure to the furnace heat and contract with the heated load; consequently a belt tigthen-

ing device with a counter balance has been provided.

The work, when charged on this moving metallic belt, begins to warm up immediately upon entering the furnace and the length of time taken to reach soaking temperature is governed by the requirements of the product. When the soaking zone is reached, the work is held thereafter at constant temperature.

As the belt emerges from the furnace it turns down around the driving pulley and the work falls off a piece at a time into the quenching tank or into a bin, without cooling from the soaking temperature. When it emerges from the furnace the work is covered until it is quenched or sufficiently cooled, to prevent oxidization.

These furnaces are made for high or low temperature work, on hardening, annealing and normalizing operations. Oil-water or any desired mixture can be used for quenching. A conveyor automatically removes the material from the quench tank. If a water quench followed by a soluable oil treatment is desired, two conveyors are used—one to move the work from the first quench to the second and the other to discharge the work.

ARIZONA UTILITIES ASS'N. ISSUES SAFETY BOOKLET

According to a statement issued by L. C. McCullough, secretary of the Arizona Utilities Association, Phoenix, Arizona, gas and electrical companies throughout Arizona are now distributing among their employees a booklet on first aid methods used in resuscitation in gas poisoning, electric shock and drowning.

These booklets are accompanied by a letter to the employee, stating that he is expected to be able to apply artificial respiration and that later this matter would be checked up. About two weeks later a meeting of the employees is held, presided over by an instructor who makes every employee demonstrate his ability, passing the ones who can perform satisfactorily and instructing the rest of them for an hour each Saturday afternoon until all employees engaged in outside work are able to apply the prone pressure method of artificial respiration.

INDUSTRIAL ADVERTISING FUND INCREASED TO $50,000

The appropriation for the trade paper advertising program now being conducted by the Industrial Gas Section of the American Gas Association has been increased from $35,000 to $50,000. The campaign is carried on through the various trade journals of industries which are large and potentially large users of gas for industrial purposes. John F. Weedon, of The Peoples Gas Light and Coke Co., of Chicago, Ill., is chairman of the committee in charge of this program.

C. J. REILLY NAMED WESTERN AGENT FOR ILLINOIS FIRM

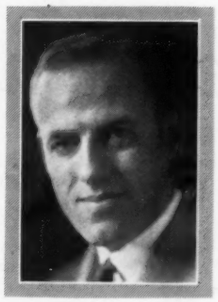
Charles J. Reilly, formerly mid-continent representative for Hammer-Bray Corporation and more recently connected with the sales department of the Public Service Company of Colorado, has accepted the post of western representative for Moore Brothers Company, manufacturer of cooking and heating products of Joliet, Illinois. Mr. Reilly has his headquarters in Denver, Colorado.

DOUGLAS, ARIZ., TO HAVE IMPROVEMENTS IN SYSTEM

Extensions in gas service in Douglas, Arizona, amounting to $21,000 are under way, according to J. P. Sexton, manager of the Arizona Edison Company in Douglas.

DEATH OF EDWIN C. FALVEY IS ANNOUNCED

Word has been received of the death on January 5th, of Edwin C. Falvey, sales manager of The Sprague Meter Co. Mr. Falvey died at Greenville, Ohio, following an automobile accident.



Edwin C. Falvey

Mr. Falvey has been with the Sprague Meter Co., in charge of branches and western sales for the past eighteen years. On January 1st he was made sales manager, and was preparing to locate in Bridgeport March 1st.

He was thirty-eight years old, and affiliated with the American Gas Association, Natural Gas Association, Midwest Gas Association, Michigan, Indiana and Illinois Gas Associations, and leaves many friends in the gas fraternity who will mourn his loss.

VENTURI VALVES DEVELOPED BY MERCO NORDSTROM

A large size plug cock designated as the Venturi Valve is being placed on production by the Merco Nordstrum Valve Company.

By making use of the Venturi principle of static head recovery, the larger sizes of plug cocks may be made with reduced cross sectional port area and still retain a high efficiency, according to the manufacturer. This new line of valves embodies an opening through the plug equal to 40 per cent of the nominal area of the pipe line in which the valve is installed. The interior of these valves is stream-lined and the maker claims recovery of from 60 per cent to 70 per cent of the pressure head normally lost over a constriction of this size.

The company has prepared a series of pressure drop charts showing pressure drops incurred in the various sizes of Venturi Valves for different fluids and conditions of line flow, particularly for gas under various pressures. These charts are available to anyone requesting them of the manufacturer.

PANHANDLE CARBON BLACK NOW MADE AT 200-TON DAILY RATE

The manufacture of carbon black in the Panhandle of Texas now amounts to approximately 400,000 pounds a day or 73,000 tons a year, equaling nearly one-half of the total yearly production in the world. The product sells for 7 cents a pound. Daily consumption of gas in the sixteen carbon black plants in operation or under construction in the Amarillo district amounts to practically 250,000,000 cubic feet.

Production of natural gasoline from plants in the Texas Panhandle which treat gas used subsequently for carbon black manufacture now totals 14,000,000 gallons monthly.

GEO. L. ROACH IS ASS'T. SALES MGR. FOR ELECTROLUX-SERVEL

Announcement is made by H. W. Foulds in charge of distribution, Servel Sales, Inc., of the appointment of George L. Roach as assistant sales manager of Electrolux refrigeration. Mr. Roach has been with the Servel organization several years and has served as general service manager since May, 1928.

SALES LEADS SECURED THROUGH B. C. ELECTRIC DRAWING

During the opening of the showroom of the B. C. Electric Railway Company the utility endeavored to compile a new mailing list and prospect list for various lines of gas and electric appliances. With this object free cards were given to every visitor to the store during the first eight days it was opened. These cards contained the space for the name, address and telephone number of each visitor and when this was filled in the card was to be dropped in the box in the third floor of the store. By placing the box on the third floor, it meant that visitors to the store had to go through the entire building from the ground floor to the top floor in order to deposit the card.

Each card acted as a coupon for a draw in which 30 prizes consisting of a gas fire, hot plate and gas tank heaters, electric cooking irons, toasters, curling irons, percolator sets, clocks, bridge tables, night lamps.

On the card was a list of the various appliances sold by the company and each customer was requested to check the appliances he was most interested in. The result was a good number of sales leads to be handed over to company salesmen.

FIRE UNDERWRITERS SHOW GAS IS NOT FIRE MENACE

Statistics compiled by the Actuarial Bureau of the National Board of Fire Underwriters list manufactured and natural gas as number 17 in a list of 22 causes for fires over a five-year period in the United States. Gas does not cause one-seventh of the fire losses due to matches and smoking, according to the report. Quoting from the report:

"The greatest fire losses are attributed to 'unknown causes.' Next in order come high risk exposure, including conflagrations, matches and smoking, electricity, stoves, furnaces, boilers and piping, defective chimneys and flues, spontaneous combustion, lightning, sparks on roofs, sparks from machinery, petroleum and its products, miscellaneous known causes, sparks from combustion, open lights, hot ashes and coal, open fires and then gas."

PACIFIC POWER & LIGHT CO. SELLS GAS PROPERTIES

Pacific Power & Light Company of Portland, Oregon, announces the sale of five gas properties in the states of Washington, Oregon and Idaho, to the Northwest Cities Gas Company. This will limit the operations of the Pacific Power & Light Company to electric utilities with the exception of a few water companies which are controlled by that company. The five gas companies which are involved are those at Yakima and Walla Walla, Washington; Astoria and Pendleton, Oregon; and Lewiston, Idaho. The consideration involved in the deal is reported to approximate $2,000,000.

TECHNICAL SCHOOL GOOD GAS CONSUMER IN VANCOUVER, B. C.

Installation of gas service for the largest all-gas school cafeteria in Vancouver has been completed by the new business department of the gas section of the B. C. Electric Railway Company. This new installation is at the newly built technical school, in which there are four heat controlled ranges, a double-decked heat controlled bake oven, a large gas-fired steam cooker, and an instantaneous automatic heater to supply hot water. It is expected that the cafeteria will serve on an average 2500 meals per day.

Welcome to the Pacific Coast

Home of

RELIANCE REGULATORS

Reliance Manufacturing Co.
Alhambra, California

Agencies *of* Progress

(*Continued from Page 21*)

What are the most significant trends in the economics of our day? We all know that they are economies in production coupled with liberal if not lavish expenditures in marketing, together with the consequent shift in employment. Since 1920, says the Department of Commerce, our factories have decreased their employees by 915,000 and our farms by 800,000 while the newer luxury and convenience industries have multiplied their workers. It is estimated that there are now 1,575,000 more salesmen in the United States than in 1920 against 1,700,000 fewer producing workmen. We are paying for use rather than ownership when we buy. Installment sales multiply and so long as public confidence is maintained that condition will not only continue but grow. We have and will continue to have to compete with many others for our proper share of the customer's dollar, and to do this our sales people must be equipped for the competitive strife.

As a most important agency of progress at this time the association has organized and sponsored and is now conducting in cooperation with a nationally known specialized organization, and based upon extensive preliminary research, a Training Course for Domestic Gas Salesmen. It is now well under way and we are happy to have practically unanimous approval from the entire industry. In many cases this approval is given with the greatest enthusiasm. It cannot but be helpful. Many companies are assisting their salesmen to finance the training and in perhaps a majority of the instances are defraying the entire expense upon proof of satisfactory completion of the course.

An outstanding agency of progress lies in fostering the construction and demonstration of fully gas equipped homes throughout the country. Captain A. E. Higgins, our field agent in this work, holds meetings with gas company representatives, manufacturers, dealers, plumbers, and tells them the story of cooperative sales efforts and laboratory-assured safety. Do you know that in the past 14 months 3,000 such Blue Star Homes have been built and 36 of them have been demonstrated in as many cities and visited by perhaps two million people who were interested enough to look for comfortable quality gas equipped homes?

Our organized effort through fall training courses, surveys, printed literature and otherwise, to educate, train and develop industrial gas sales engineers, is not new and is well-known throughout the industry. It is one of the most important agencies for the progress of the industry though it is not new.

COOPERATIVE ADVERTISING

The New England Plan of Cooperative Advertising will be fully explained to you. The principle involved in this plan has been officially endorsed by the Executive Board of the American Gas Association and the Publicity and Advertising Section, in cooperation with the other sections, is engaged in formulating general principles for carrying out such plans regionally in the country to serve as a general basis to be undoubtedly changed where needed to meet advertising conditions. In New England the plan apparently works. I can imagine no reason why it should not work elsewhere.

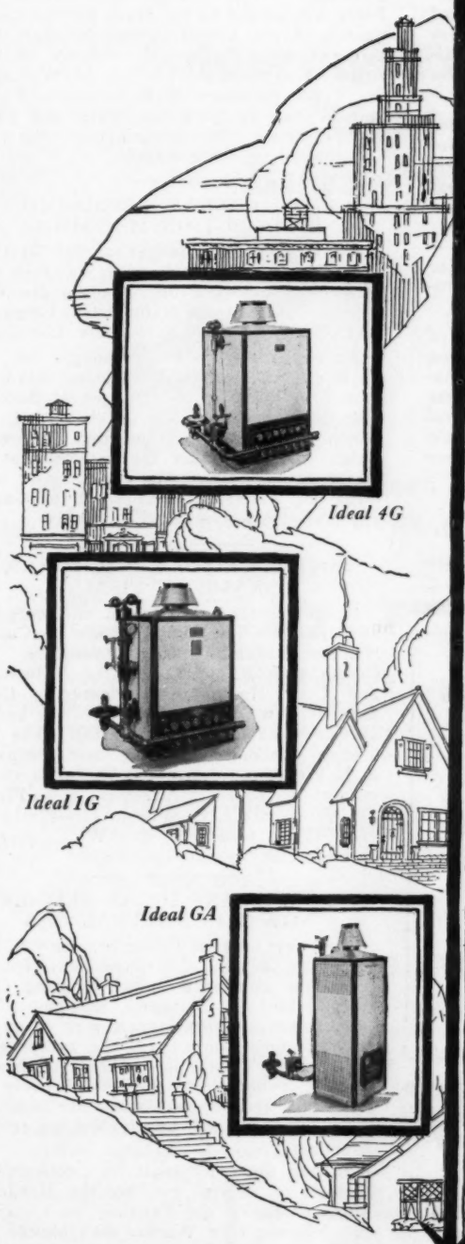
To repeat, it is possible only to touch a few high spots. These agencies of progress have been officially approved and financed by our Executive Board and the Association machinery and resources are engaged in their execution. They represent the demands of the time and the vision of the future as determined by the responsible men of the industry and we believe that they meet the more urgent necessities of the day.

CONSOLIDATION OF TEXAS COMPANIES ANNOUNCED

Consolidation of the Texas County Gas Company with the Cimarron Utilities company, all properties to be operated under the name of the latter company, has been announced. The Texas County Gas Company owns gas transmission lines in Texas County, also gas distribution systems in Goodwell, Guymon, Hooker, Texhoma and Tyrone and the Cimarron Utilities Company owns electric, water and ice systems in Texhoma and Boise City. The consolidation makes this one of the largest utility companies operating in the Oklahoma Panhandle. A. J. Hardendorf, who was president of the Texas County Gas Company, becomes vice president of the Cimarron Utilities Company.

MAJOR T. J. STRICKLER TO HEAD CHARITIES CAMPAIGN

Major T. J. Strickler, vice-president and general manager of the Kansas City Gas Company, who served as chairman and director of the Kansas City Allied Charities Campaign for 1928, has been reappointed to that post for the coming year. Major Strickler is the first Kansas City man ever to be chosen as director of more than one of the campaigns. As appreciation for his work during the past year he was recently presented a loving cup by the Kansas City Chamber of Commerce at the annual dinner of that body.



AN IDEAL GAS BOILER *for* EVERY *heating need!*

For cottages or bungalows—with or without basements—an Ideal Arcola Gas Heater!

For small or medium-sized homes —Ideal 1G Gas Boiler!

For larger homes and buildings— Ideal 4G Gas Boiler!

For office buildings, big apartment houses, hotels — Ideal 4G Gas Boilers in multiple units!

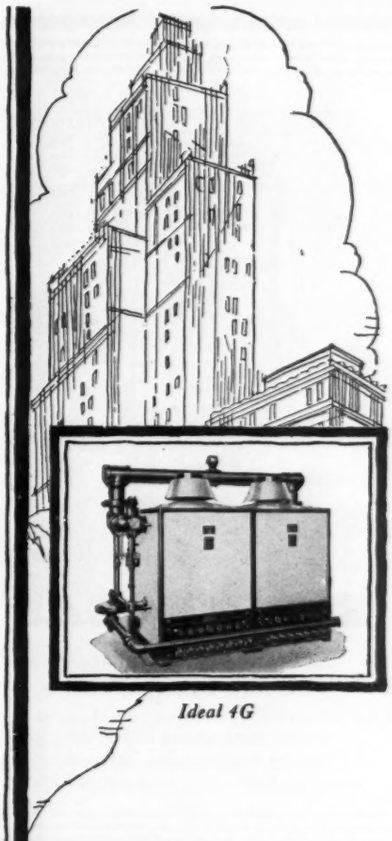
All these boilers are useful for large-volume hot-water supply and industrial applications.

THIS whole family of perfectly-designed gas boilers offers you *exactly* the right heating plant for *every* job on which you want to figure.

Designed and manufactured by the American Radiator Company, it is the latest triumph of their boiler engineers.

Ideal Gas Boilers are made available to you without delay by strategically-located distribution centers.

We have prepared for you a plan book covering every detail of selling plans that actually *work*. Won't you send for this complete and practical information?

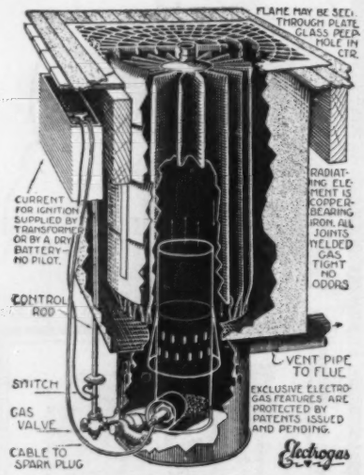


IDEAL GAS BOILERS

Product of AMERICAN RADIATOR COMPANY *Gas Utilization Dept.*

Write to AMERICAN GAS PRODUCTS CORPORATION, *Distributors*

376 Lafayette Street, New York City


FLAME MAY BE SEEN THROUGH PLATE GLASS PEEP HOLE IN CTR.
RADIATING ELEMENT IS COPPER-BEARING IRON. ALL JOINTS WELDED GAS TIGHT NO ODORS
CURRENT FOR IGNITION SUPPLIED BY TRANSFORMER OR BY A DRY BATTERY—NO PILOT
CONTROL ROD
VENT PIPE TO FLUE
SWITCH
EXCLUSIVE ELECTRO-GAS FEATURES ARE PROTECTED BY PATENTS ISSUED AND PENDING.
GAS VALVE
CABLE TO SPARK PLUG
Electrogas

ELECTROGAS

—a good floor furnace.
—in four sizes.

Also available in walnut finished cabinet form for second floor use.

ELECTROGAS FURNACE CO.
RIALTO BLDG. SAN FRANCISCO

Rex-Patrol Tank Heater

WITH distinct pride and satisfaction we announce the introduction of the New Rex-Patrol Tank Heater—a new water heater that is a real tribute to the ideals, traditions and accomplishments of The Cleveland Heater Co.

This new Rex-Patrol Water Heater is revolutionary as well as evolutionary in principle. It is an automatic or self-action tank water heater that may be attached to any range boiler. Thermostatic control and gas safety pilot are a part of the water heater—there are no accessories required to make this water heater entirely automatic.

The Rex-Patrol Tank Heater, of course, is approved by the Testing Laboratory of the American Gas Association and carries the Blue Star Seal. Last but not least, Rex-Patrol Tank Heaters sell at the price within reach of everyone. Nor is that all—let us send you the *whole* story.

The Cleveland Heater Co.

1900 W. 112th St. Cleveland, Ohio

Duro Low Pressure Gas Burner

Patented in U.S.A.

The Duro Low Pressure Gas Burner is the culmination of many days of research, numerous combustion tests and practical trials in the drilling field, and in industries.

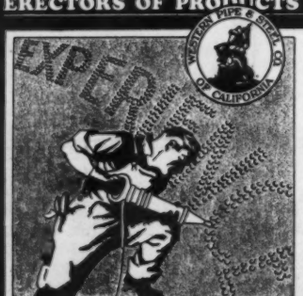
Duro flue gas analysis tests show CO2 contents running from 10.5 to 11.5 per cent. Uses minimum gas volume, Simple to install.

Write Us for Information

DURO GAS BURNER, Inc.
228 Atco Bldg. TULSA, OKLA.

W P & S

DESIGNERS, FABRICATORS & ERECTORS OF PRODUCTS OF **STEEL**



Investigate WESTERN Hi-Pressure Unit Gas Holders

WESTERN PIPE & STEEL COMPANY
5717 Santa Fe Ave. LOS ANGELES — **OF CALIFORNIA** — 444 Market Street SAN FRANCISCO
FACTORIES
LOS ANGELES · SOUTH SAN FRANCISCO · FRESNO · PHOENIX · TAFT

W P & S

APACHE GAS COMPANY BUYS PERRY-LOVELL, OKLA. SYSTEMS

The Apache Gas Company has purchased the natural gas distribution systems, which will serve Perry and Lovell, Oklahoma, according to announcement by Wilbur J. Holleman, Oklahoma City, vice president of the company. The new owners took charge of both plants January 1. The company intends to supply gas to these towns from the Logan County gas fields, according to Mr. Holleman. The natural gas system at Perry was owned by the Perry Service Company and the Lovell system by Earl W. Baker Utilities Company. Officers of the Apache Gas Company are: S. M. Williams, Jr., Tulsa, president, B. R. Williams, Tulsa and Wilbur J. Holleman, Oklahoma City, vice-presidents. Mr. Holleman is also general counsel for the company.

R. W. CURRAN APPOINTED DISTRIBUTION MANAGER

R. W. Curran, manager of the Bartlesville Gas & Electric Company, has been appointed as manager of Arkansas distribution for the Arkansas Natural Gas Company with headquarters at Shreveport, Louisiana.

A. F. Potter, former manager of the Carthage, Missouri, Gas Company, has been named to the post of manager at Bartlesville. He will also be in charge of the Union Public Service Company at Dewey, Okla., formerly under the management of Harry Siebenthaler. Mr. Siebenthaler succeeds Mr. Potter as manager of the Carthage Gas Company.

CUTLER-HAMMER, INC., IS NEW NAME OF FIRM

Uniting under one name in an incorporation under the laws of Delaware, the Cutler-Hammer Manufacturing Company, the Cream City Foundry, and the Milwaukee and Cutler-Hammer Manufacturing Company of New York, hereafter will be known as Cutler-Hammer, Incorporated. The following are officers of the new company: B. L. Worden, president; F. R. Bacon, chairman of the board of directors; F. L. Pierce, vice-president; J. C. Wilson, vice-president; H. F. Vogt, treasurer; and W. C. Stevens, secretary.

NEW ORLEANS SUGAR REFINERY NOW HAS NATURAL GAS

The New Orleans Public Service Co., Inc., of New Orleans, Louisiana, has recently piped the American Sugar Refining Company plant at Chalmette for gas. This plant constitutes the largest user of gas on the company's lines with the exception of the company's own power house on Market Street. A minimum of 6,000,000 cubic feet per day and a maximum of 13,000,000 cubic feet daily will be supplied the refining company.

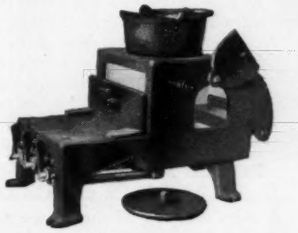
Among the other indsutrials converted to the use of natural gas are the Henderson Sugar Refinery, the Panama Ice Company, the Johnson Iron Works, the Jahncke Dry Dock & Shipbuilding Company, the Ford Motor Company and the Cloverlands Dairy Products Company.

B. C. JUNIOR HIGH TO HAVE GAS SYSTEM

Construction of a new Junior High School is now being carried on at Kerrisdale, Vancouver, B. C. When completed this school will have a cafeteria capable of accommodating 1500 students. Gas will be used entirely for cooking and heating in this department of the school.

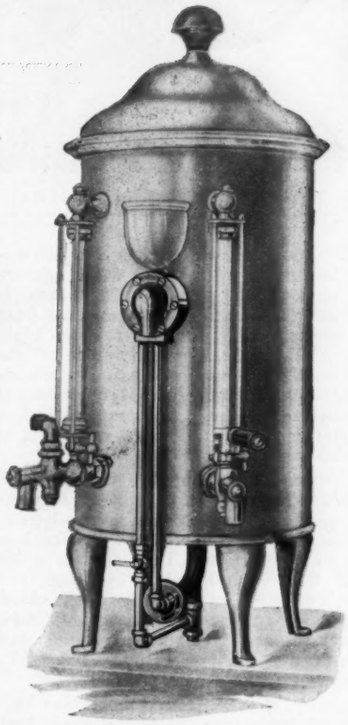
JOHNSON G-A-S

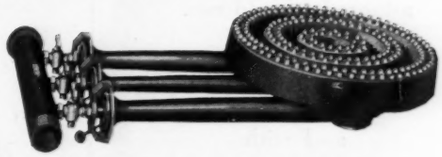
Soldering Furnaces—Melting Furnaces
Heat-Treating Furnaces
Burners—Torches—Appliances



A Stout Bench Furnace with Three Distinct Uses

The Johnson No. 118 Combination Bench Furnace is built to endure long, hard usage. It will heat the largest soldering coppers; up to 22 pounds of soft metal may be melted in the melting pot; and the furnace may be used for tempering, heat-treating, annealing, and case-hardening. A versatile bench furnace which will render long, efficient service.





Triple Atmospheric Gas Burners

Perfect Combustion Insured by Improved Johnson Venturi Air Mixers and Tubes
One of the greatest improvements of recent times is the new Johnson Venturi Air Mixer and Tube. Perfect combustion is attained, and this results in a much higher flame temperature. Johnson Burners are made up of three independent burners which may be used singly, in pairs, or in triple. Constructed of heavy cast iron. ***Write for full details of any standard or special type of burner.***

TAKE ADVANTAGE OF THIS NEW AND PROFITABLE MARKET!

Thermostatic Heat Control for Coffee Urns and Steam Tables

A fertile market has been thrown open by the advent of the Johnson Thermostatic Heat Control for coffee urns and steam tables. Restaurants and cafeterias everywhere are quckly recognizing this device as being a valuable adjunct to the economical and efficient operation of their coffee urns and steam tables.

The Johnson Thermostatic Heat Control has been subjected to exhaustive tests and widespread use. It is absolutely fool-proof. May be quickly and easily attached to any urn or steam table. The results of its use are so obvious and valuable, that restaurant and cafeteria managers proclaim it as being one of the most needed inventions of recent times.

[Further economy in gas consumption may be effected through the use of the new-type Urn Burner. This burner sets near the bottom of urn or table with the result that maximum flame heat is utilized. Also quickly and easily attached to any urn or table.]

Write for free Catalog covering all Johnson Gas Appliances

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. Babcock Co.
135 Bluxome Street San Francisco, California

Gas Gravities

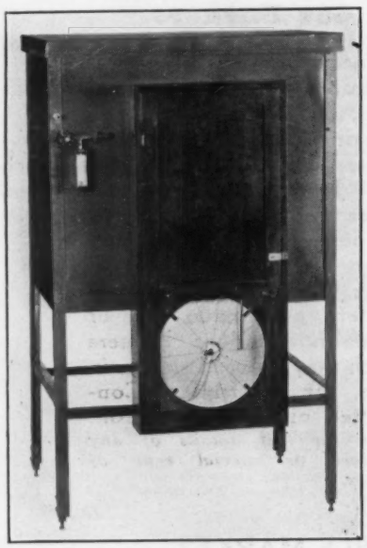
Easily and Accurately Obtained with

Ac-Me Gravity Balance

A portable gravity instrument especially adapted to field use.

Write for
Bulletin No. 3

and with
AC-ME Gravitometer

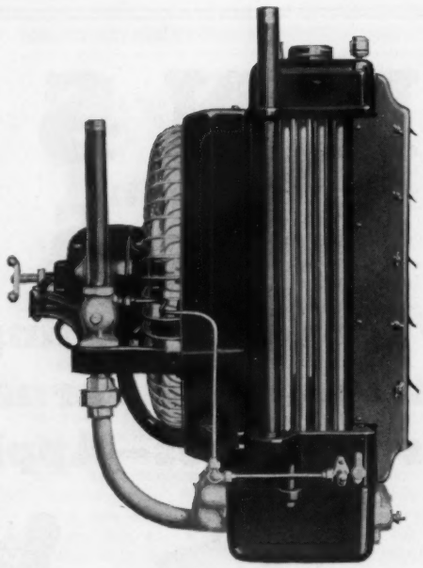


Improved and Fully Compensated
A gravity instrument which will give an accurate, dependable record of gas gravities at all times.

Write for
Bulletin No. 2A

The Refinery Supply Company

Tulsa, Oklahoma
Dallas, Texas



Humphrey Industrial Unit Introduced

AN industrial unit gas heater which embodies, in addition to other advantages of such equipment, new features of low initial cost and compactness, has been put on the market by the General Gas Light Company. The heater is known as the Humphrey Industrial Unit, and its heating capacity is approximately the equivalent of 400 square feet of ordinary steam radiation, the heater fan delivering 1,800 cubic feet of heated air per minute.

The Humphrey Industrial Unit is self-contained. No connection is needed except the pipe which conveys gas to the burner. No boiler equipment is required, and no heat is lost by conduction. The Humphrey Industrial Unit is designed to be hung from the ceiling, as it is primarily intended for heating large spaces. Thus low installation and removal cost is assured, together with cleanliness and economy of operation, and a minimum of space requirement.

Simplicity of design and operation is a feature of Humphrey Industrial Unit heaters. Above a bank of Ni-Chrome gas burners is a battery of brass tube radiators, so arranged that heat from the burner is distributed up through the tubes, the combustion products being carried away by a perforated cap flue, or a ceiling flue if the room to be heated is small. Behind the tubes is a fan, propelled by a 1/6 h. p. motor. Air drawn in by the fan is driven across the heated tubes. Louvers at the front deflect the heated air to any desired level. The fan also delivers air under pressure to the burner box, increasing burner efficiency.

Heat control can be maintained by a thermostat, arranged to actuate the motor; the motor in turn is equipped with a governor that turns the gas on and off as required to support an even temperature. Pilot lights on either side of the burner, which take care of ignition, control a thermostatic switch that automatically prevents the motor from operating in case the pilots are extinguished, and keeps it, and consequently the gas supply, turned off until the pilots are relighted.

Upkeep consists solely of oiling the moving parts and cleaning the radiator tubes from time to time. As the burner unit swings down upon hinges, no difficulty is encountered in reaching the tubes. All parts are independently removable in the event of replacement.

Owing to the fact that they require no steam boiler connection, Humphrey unit heaters are expected to prove especially desirable for plants where steam is not required for other purposes, and for stores, warehouses, garages, dance halls, auditoriums, churches and drying rooms of many kinds.

The new heaters are already on production, according to the manufacturer.

ROYAL FAVOR IS SHOWN GAS REFRIGERATION

Word has been received in the United States that the kitchens of Buckingham Palace, as well as the London residence of the British king and queen, have been equipped with gas refrigeration. Report has it that a three-year trial must precede publication of this news in the British Empire. If the equipment gives satisfaction during that period the refrigerator manufacturer may then exploit the fact, and may stamp on his product the words "By Appointment To His Majesty, The King."

ROCKY MOUNTAIN ASS'N. TO MEET IN CALGARY

A joint meeting of the Rocky Mountain Oil and Gas Association and the Montana Chapter of that Association will be held in Calgary, Alberta, Canada, if present plans are carried out. It was tentatively agreed that the meeting will take place in September to give the visitors an opportunity to visit the scenic districts of western Canada. B. B. Brooks, former governor of Wyoming, is president of the parent organization.

30,000-GALLON CAPACITY FOR WICHITA PLANT

Additional equipment installed at the Wichita, Kansas, gasoline plant of the Empire Oil & Refining Company has increased this plant to a daily capacity of 30,000 gallons. This plant is located on the City Service gas line from the Panhandle field.

DURANGO, COLO., TO HAVE GAS FROM NEW MEXICO

Gas from wells in the "Ute Dome," New Mexico, will serve the city of Durango, Colorado. The Mesa Grande Gas Company, distributing company securing the franchise, is building a six-inch pipeline from the Midwest Refining Company wells near La Plata, New Mexico, to the Colorado town.

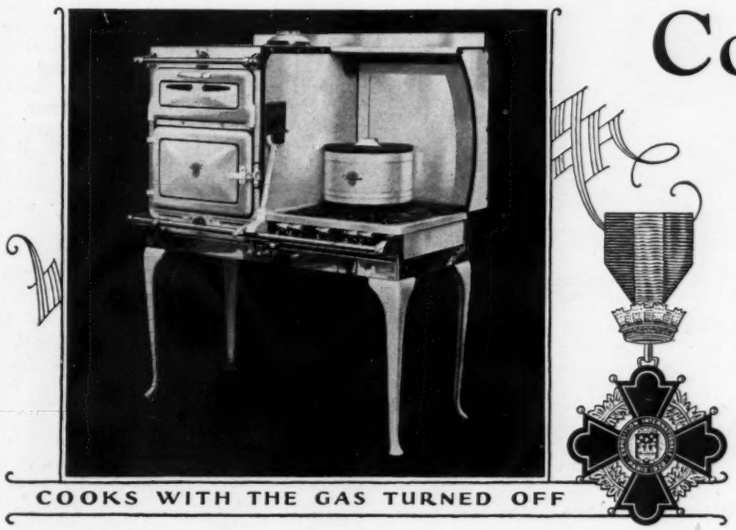
SANTA MARIA GAS CO. ASKS FRANCHISE FOR NEW LINE

The Santa Maria Gas Company of Santa Maria, California has applied to the Railroad Commission for the privilege of extending its lines from San Luis Obispo north through the towns of Santa Margarita, Atascadero and Templeton to Paso Robles.

SERVEL ANNOUNCES TWO NEW WESTERN APPOINTMENTS

Servel Sales, Inc., announces two new appointments in the western territory. J. P. McDermott is named as district sales manager in Kansas City, Kansas; and R. M. Billhimer is appointed district sales manager in Arkansas, Louisiana and Mississippi.

What About Electric Range Competition Anyway?



GRAND PRIZE
An exclusive award to The Chambers Mfg. Co., in competition with all ranges exhibited at International Exposition in Paris, 1928.

ONE gas man said this: "There is, of course, a great deal of romance connected with electricity which has been exaggerated by very clever advertising and propaganda."

He knew whereof he spoke. The electric range people were making deep inroads into his gas business. Eventually he licked them, and he did it with the Chambers Insulated Gas Range. He is frank enough to say that he couldn't have saved the situation with ordinary gas ranges.

Now, we suggest that the best means for a gas company to combat electric range competition is to exploit the most efficient gas range on the market today. That gas range is the Chambers.

The Chambers Range is a stabilizing influence. A Chambers lasts for fifteen to twenty years and a Chambers user is immune to the arguments of electric competition.

Besides, when you sell a range that far outserves any other range obtainable, the customer is your staunch friend. You can sell that customer gas water heaters and ironers and other gas appliances. In the long run, the Chambers Range does not cut but boosts your revenue, even though it admittedly IS exceptionally economical in gas consumption.

Now, we maintain an exclusive selling policy. In many instances we would rather be represented by a gas company range store than by an independent dealer,—provided that gas company is aggressive. If this proposition sounds interesting and if there is no Chambers representative in your city, let's get together and see what can be done on the matter.

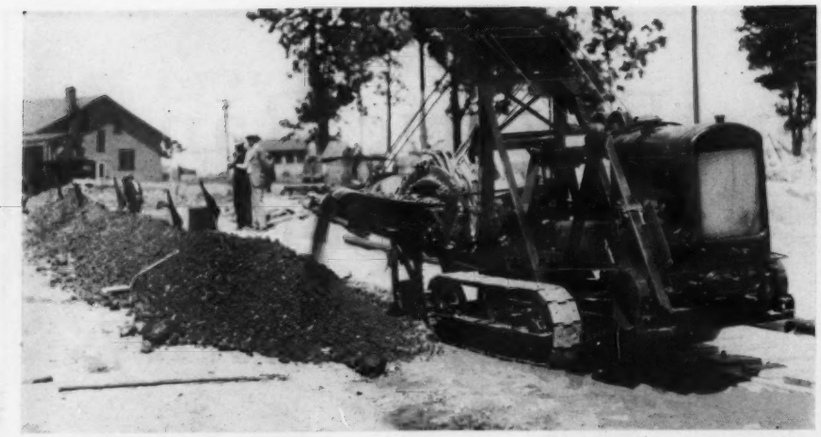
We are prepared to furnish a brand of co-operation that will mean a lot to you.

The AUTOSTAT is set for each baking to automatically shut off the gas. Takes the guess out of cooking. Insures uniform success.

The CHAMBERS MANUFACTURING CO.
20 Columbus Park *Shelbyville, Indiana*

Originators of the insulated gas range, the Thermodome and the Autostat

Chambers
AUTOSTAT GAS RANGE



Results You Can't Ignore!

Statistics compiled from the experience of 100 Gas Companies, using Baby Diggers, show that these trenchers were usable on 90% of their distribution work and that the average cost was less than 25% of former costs by hand labor.

The Baby Digger, extremely compact and mobile, yet sturdily built and powerful, practically eliminates your expensive hand labor, as it delivers a maximum trench footage, even in the most limited areas and toughest soils. You cannot afford to be without this valuable piece of equipment. Write today for information.

THE CLEVELAND TRENCHER CO., 20100 St. Clair Ave., Cleveland, Ohio

"Pioneers of the Small Trencher"

Edward R. Bacon Co., 17th at Folsom Street, San Francisco, California, Distributor

THE BABY DIGGER

Stockton

Fire Brick Company

FIRE BRICK, INSULATING BRICK
HIGH TEMPERATURE CEMENT

High Grade Refractories

for

GENERATOR LININGS

CHECKERS

BOILER SETTINGS

OFFICE:
Russ Building,
San Francisco

WORKS:
Stockton,
California

EL PASO GAS CO. LETS CONTRACT TO BUILD GAS PIPELINE

Conner & Son Construction Company of Kansas City has announced the securing of the contract for the construction of the gas line into El Paso awarded by the El Paso Gas Company. The contract for the pipe which is to be 16 inches in diameter has been awarded to the A. O. Smith Corporation, of Milwaukee, Wisconsin. The line will be approximately 205 miles in length.

The El Paso Natural Gas Company, organized for the purpose of piping the gas into El Paso, has contracted for a gas supply from the Texas Production Company, Amereda Petroleum Corporation, Columbia Carbon Company and the Midwest Refining Company, gas producers in Lea County, New Mexico, where the line will originate. The Texas Cities Gas Company will distribute the gas in El Paso.

KANSAS TOWNS GRANT PERMITS TO WESTERN GAS COMPANY

The Western Gas Company, of Salina, Kansas, a subsidiary of the Public Utilities Investment Company, has secured gas franchises from several towns in central Kansas, which will be supplied with gas from the gas field north of Bison, Kansas. Among the towns reported to have granted franchises are Great Bend, Hoisington, Olmitz, Bison and LaCrosse. The company is also seeking franchises in Ellinwood, Larned, Hays, Ellis and Russell.

KANSAS CITY GAS CO. WINS HENRY L. DOHERTY CUP

The Henry L. Doherty loving cup was presented to the Kansas City Gas Company for the second successive time in the recent customer-ownership campaign conducted by the Gas Service Company. This cup is awarded to the division selling its prize quota first. The B. C. Adams trophy was given to the Wichita Division for selling its quota the greatest number of times.

During the campaign 13,722 shares of stock were sold by all divisions.

A. V. BORQUE RECEIVES GIFT FROM GASOLINE ASSN.

As an expression of appreciation of the work done while secretary of the Natural Gasoline Association of America, A. V. Bourque was presented with a new sport model Ford coupe on Christmas day. The car was presented to Mr. Bourque, who resigned his office of secretary on December 15 to become secretary of the Western Petroleum Refiners Association, as a gift from his friends in the Natural Gasoline Industry. He had been secretary of the Gasoline Association since its organization in 1921.

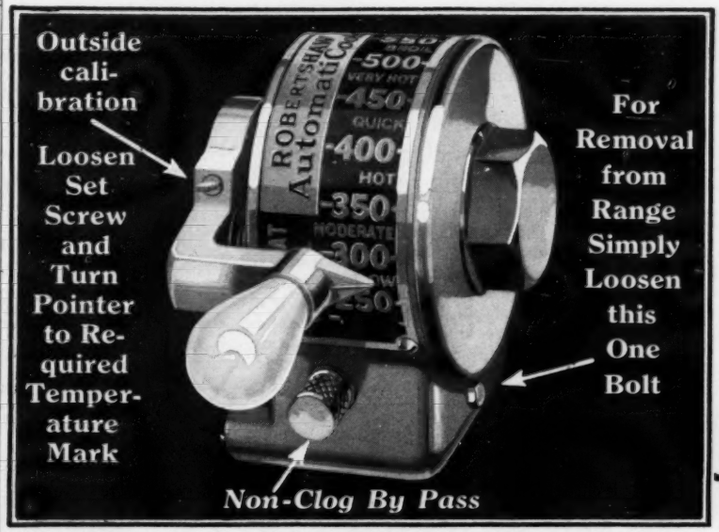
JOE ZEPPA ACCEPTS POST WITH MACMILLAN PETROLEUM

According to announcement, Joe Zeppa, secretary of the Arkansas Natural Gas Corporation, with headquarters at Shreveport, has accepted the office of vice-president of the Macmillan Petroleum Corporation of Los Angeles, California. His resignation of the office with the Arkansas Natural becomes effective as soon as he can bring his affairs to a close at Shreveport.

ELK CITY, OKLA., TO HAVE LARGER PIPELINE

Work has been started on a 6-inch gas pipeline to Elk City, Oklahoma, from the Sayre field to replace the 4-inch line which now carries gas through this line to Elk City and Carter.

GAS COMPANIES and STOVE DEALERS



Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

GAS

or

WATER

Connections

whether screw thread or gasket, should be made up with KEY SPECIAL PIPE JOINT COMPOUND.

KEY SPECIAL PIPE JOINT COMPOUND is not a quick hardening cement, but a plastic lubricant and a filler that will seal the most obstinate joint with ease. It covers more surface than an equal volume of red or white lead, thereby reducing the cost. It is waterproof—and there is no waste.

Manufactured by

E. A. Key Co., Inc.

1431 Santa Fe Ave.
Los Angeles, Calif.

Distributors in all principal cities.

WRITE FOR FREE SAMPLE

GAS SERVICE COMPANY GETS MONETT, MO. FRANCHISE

At an election held the latter part of December, a gas franchise was voted by the city of Monett, Missouri, to the Gas Service Company. Franchises have also been granted the company at Neosho, Pierce City and Marionville. Pipe line now under construction to these cities is expected to be completed in February.

HENRY L. DOHERTY OPENS OKMULGEE, OKLA., OFFICE

A branch office of Henry L. Doherty & Company, securities representatives of Cities Service company, has been opened at Okmulgee, Oklahoma. Mack Harlow, formerly connected with the plant of the Empire Oil & Refining Company here, is in charge of the Okmulgee branch office.

H. LEE JONES SUCCEEDS THE LATE COL. TIMMONS

H. Lee Jones, director of the Kansas Public Utility Information Bureau, has been appointed assistant to the vice-president of the Kansas Gas & Electric Company at Wichita to succeed the late Colonel R. H. Timmons, who was drowned recently near Parsons, Kansas. Mr. Jones' appointment was effective January 1.

CITIES SERVICE CO. REPORTS PROFITABLE YEAR

Net earnings of the Cities Service Company reached $3,242,298 for the month of December, bringing the 1928 total to $33,584,465. Earnings for December exceeded by $469,000 the net earnings of the corresponding month in 1927, and net earnings for the calendar year were $1,631,000 more than during 1927.

OKLAHOMA NATURAL GAS CORP. TO BUILD MUSKOGEE LINE

A new 8-inch gas pipeline is being built by the Oklahoma Natural Gas Corporation into Muskogee from the Keefeton field. The company is also constructing a regulating station at the southeast city limts. This is the third main supply line which the company has leading into Muskogee.

TAPPAN REPRESENTATIVES MEET AT MANSFIELD, O.

R. B. Wheeler, Pacific Coast manager for the Tappan Stove Company, together with Harry Mayer, Southern California manager for the company, expect to leave the coast on February 6 to attend the annual sales meeting of the Tappan Company at Mansfield, Ohio.

W. H. BUCKLEY NAMED V.-PRES. OF RESERVE NATURAL GAS CO.

W. H. Buckley, head of the pipe line department of the Arkansas Natural Gas Corporation, has been appointed general manager of the Reserve Natural Gas Company, one of the properties of the Arkansas Natural, succeeding C. A. Daley, who resigned to accept the post of general manager of the Penn-Ohio Gas Company of Pittsburgh, Pa. Mr. Buckley assumed his new duties on January 1st.

EDITOR OF P. G. AND E. PROGRESS DIES AT CALIFORNIA HOME

The death of C. E. Kunze was announced on December 21. Mr. Kunze was editor of P. G. and E. Progress, the employee organ of the Pacific Gas and Electric Company of San Francisco, California.

DIXIE PLANS LINE TO REACH FOUR GAS FIELDS

A gas line which will tap four fields for the Dixie Gulf Gas Company's northeast Texas-to-Houston system is to be constructed by that company. The gas fields touched will be Barbers Hill, Goose Creek, Liberty and Dayton. Six, eight and ten-inch pipe will be used.

WISCONSIN PUBLIC SERVICE CO. TO BUILD COAL-GAS PLANT

Wisconsin Public Service Corporation will erect a modern coal gas manufacturing plant at Sheboygan, Wisconsin, according to an announcement made by Halford Erickson, vice-president of the Byllesby Engineering and Management Corporation. The new plant is scheduled for completion by January 1, 1930.

PUBLIC SERVICE CO. OF COLO. PLANS IMPROVEMENTS

Expenditures totalling $3,600,000 are planned by the Public Service Company of Colorado for 1929, as announced by Clare N. Stannard, vice-president and general manager of the company. This amount will be budgeted to cover routine improvements, continuation of service and the improving and reconditioning of equipment.

ARKANSAS TOWNS TO BE SUPPLIED WITH GAS

Gas franchises have been granted to the Public Utilities Corporation of Arkansas at De Queen, Ashdown, Mineral Springs and Nashville, Ark., according to press reports. Gas will be supplied the cities through lines which will tap the Arkansas Natural line at Spring Hill, South of Hope.

HOME SERVICE WORKER LEAVES B. C. ELECTRIC

Miss Isabel Smith, domestic science expert of the British Columbia Eectric Railway Company has resigned her position with the gas department and has accepted a post as dietitian in a Montreal hospital.

COAST COUNTIES ASKS PERMIT TO SELL STOCK

Coast Counties Gas and Electric Company with headquarters at Santa Cruz, California, has applied to the California Railroad Commission for authority to issue $1,000,000 of 6 per cent convertible preferred stock.

ST. JOSEPH, MO., NOW RECEIVING NATURAL GAS

Six men of the Wichita Gas Company were transferred to St. Joseph, Missouri, to assist in the adjusting of appliances and turning of natural gas into the mains of the St. Joseph Gas Company, which was completed in January.

E. H. KIFER IS PRES. OF SAN ANTONIO CHAMBER OF COM.

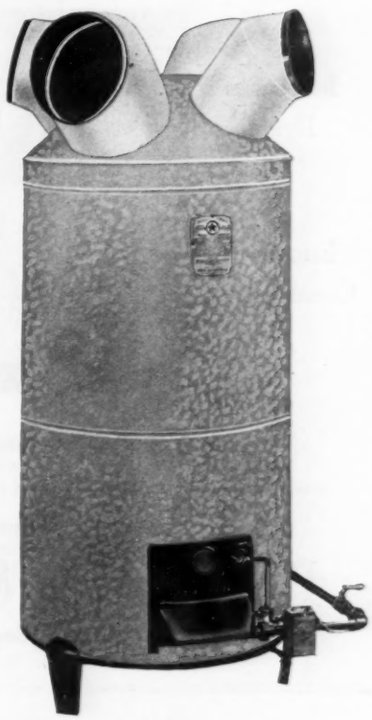
E. H. Kifer, vice-president and general manager of the San Antonio Public Service Company, was unanimously elected to the presidency of the Chamber of Commerce of that city in December.

GYM AND DANCE PAVILION FOR NEW ORLEANS EMPLOYEES

Members of the New Orleans Public Service, Inc. Employees' Association are now enjoying the use of a gymnasium and dance pavilion, into which the old Citizens Plant on Carrollton Avenue in New Orleans has been converted.

The Pacific Announces a New Line

of Unit Gas Furnaces Approved by the American Gas Association



This furnace is round instead of square. As a result there are no corners and no dead air spaces. There is better circulation because of the absence of corners. Consequently, heating is accomplished more quickly. The heating element is completely welded throughout, is gas tight, and permits no combustion fumes to escape. The heating unit is of 20-gauge pure Ingot Iron Toncan metal, known for its rust resisting qualities.

Pacific has devoted years to the development of this new furnace which now carries the BLUE STAR OF APPROVAL. Back of this approval is our 15 year old reputation as the leading and largest gas heating organization in the West.

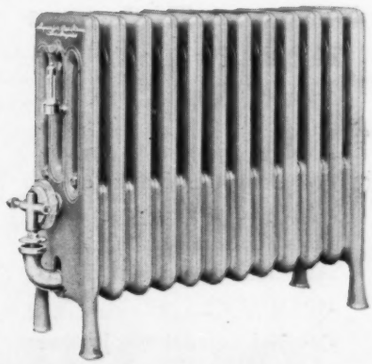
New Multi-Tubular Burner

Each burner has its independent injection of gas. Primary air for combustion is directly siphoned at each individual burner. There is no need for adjusting of the gas and air for combustion as this new Pacific Burner is scientifically designed to automatically give the correct proportion of air to gas. This results in complete combustion and a high temperature flame of proven economy. No soot. No odors.

Pacific Unvented Gas Steam Radiators Also Approved

By selling the Complete Pacific Line You Have the Advantage.

Because with the complete Pacific line you can offer the correct solution to every heating problem. Where other heating salesmen stress their particular appliance, our agent selects from a full line the appliance best suited. We have a real money making proposition. Write for particulars.



And NOW, Pacific Unvented Gas Steam Radiators, furnished in 4 column pattern 26, 32 and 38 inches high, carry A. G. A. BLUE STAR SEAL OF APPROVAL. In addition to this approval, the Pacific Gas Steam Radiators are approved by the Underwriters' Laboratories.

Pacific Gas Radiator

Gas Heating **Company** *Headquarters*

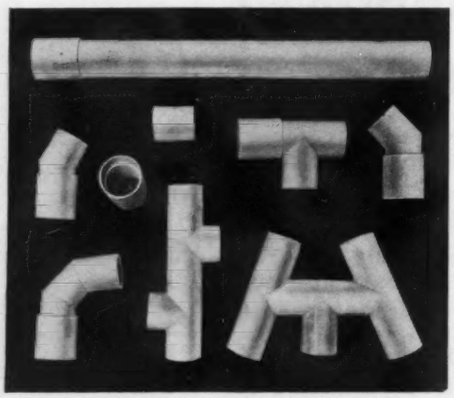
Roseberry and Walter Streets, Huntington Park, California

MANUFACTURERS *of* EVERY TYPE *of* GAS HEATING APPLIANCE

VITEX

Increases Draft

Improves Combustion



Absolutely Non-Corrosive

The Perfect Gas Vent and Flue Pipe

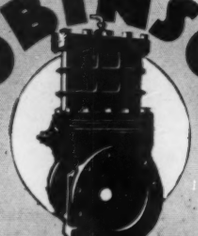
Samples, prices, and installation information gladly furnished on request

Manufactured by

Plant Rubber & Asbestos Works

537 Brannan Street, San Francisco, Cal.

ROBINSON



ORIFICE FITTINGS

They eliminate old style by-pass
They save materials
They save time
They save labor
Changing plates is simplified
Orifice is always centered
Frequent inspection is possible
Occupy little space
Make for better metering
No hazards
Cannot leak, etc.

ROBINSON ORIFICE FITTING COMPANY
1435 SANTA FE AVENUE
LOS ANGELES, CALIF., U.S.A.

California Oxide

Removes Hydrogen Sulphide from Gas at Low Cost

A highly potent Commercial Compound developed after years of research and tests conducted by Los Angeles' foremost chemist.

—Used extensively by gas companies for removing Hydrogen Sulphide from gas, at low cost, with highly efficient results.

California Oxide Co.
308 East Eighth Street
Los Angeles
Phone: TRinity 0769

SOUTHERN NATURAL GAS CO. TO SUPPLY BIRMINGHAM, ALA.

The Southern Natural Gas Co., of Birmingham, Alabama, following the completion of an industrial survey made in Birmingham to determine whether gas could profitably be brought to that city, has decided in the affirmative according to an announcement made at the Convention of the Southwest Division of the Natural Gas Department by Julius Naiman of Arthur L. Mullergren, consulting engineers who made the survey. Purchase of right of way is likely to begin within a few weeks time, it was said.

The line will extend from the Monroe and Richland fields through Birmingham to Atlanta and Chatanooga, a distance of 800 miles. From the fields to Birmingham the line will be 24 inches in diameter and the remainder of the way will be 20 inches in diameter. It was said that contracts for 75,000,000 cubic feet daily have already been signed by industrial consumers. The maximum capacity will be approximately 120,000,000 cubic feet. R. C. Sharp, formerly associated with the Oklahoma Natural Gas Corporation, is manager of the Southern Natural Gas Company.

F. W. INSULL IS NAMED PRESIDENT OF S. W. L. & P. CO.

Fred W. Insull of Tulsa, formerly vice-president of the Southwestern Light & Power Company, was elected president and general manager at a meeting of directors of the company in Oklahoma City, December 20. He succeeds Earl R. Ernsberger who resigned to devote his entire attention to private business interests. For several years Mr. Insull has been president of the Public Service Company of Oklahoma with headquarters at Tulsa. Both properties are subsidiaries of the Middle West Utitlities Company of Chicago, and are controlled by the Insull interests. Before adjourning the directors adopted a resolution thanking Mr. Ernsberger for his efficient management of the company and expressing regret over his resignation.

J. C. BROKAW ACCEPTS POST WITH SEXTON CORP.

J. C. Brokaw, operating manager of the Dixie Gulf Gas Company, has resigned that position to take charge of the oil and gas division of the engineering and contracting firm, the Sexton Corporation, at its Houston office just recently opened. The local office of the corporation is in the Post Dispatch Building. Mr. Brokaw became associated with the firm on the 1st of February.

INDEPENDENCE, KAN., COMPANIES TO MERGE

Stockholders in the Commercial Gas and Oil Company of Independence, Kansas, together with two other companies of the same city, the Lynn Pipeline Company, and the Commerce Gas Pipeline Company, have voted to merge their companies into the Commercial Gas Pipeline Company. T. S. Salathiel of Independence is president of the three companies. The capital stock of the new company is $100,000.

GASOLINE PLANT TO BE BUILT BY INDIAN TERRITORY CO.

A gasoline plant is to be constructed by the Indian Territory Illuminating Oil Company, on its lease in the Oklahoma City oil field. The well is producing 7,000,000 cubic feet of gas per day, according to report.

STATEMENT OF
PACIFIC GAS AND ELECTRIC COMPANY
APPLIANCE SALES POLICY

We believe that the public must be served.

That best public service can only come from a united industry, composed of the utility, appliance manufacturers, jobbers and dealer trade.

That an organized effort by the entire industry is essential if the maximum amount of business is to accrue to each group through creation of consumer acceptance of our products.

That such a united industry can and will successfully compete with other organized industries to the end that a fair share of the public buying power will be obtained.

That it is the **duty** of the utility particularly to do pioneering selling in that appliance field where there is no public demand or due to special conditions no adequate retail profit for creative and aggressive selling by retailers.

That the utility, in addition to supplying quality service at fair rates, assume leadership in the sale of quality appliances at established retail prices, adhering to ethical, constructive merchandising methods on a basis that will encourage the activity of all legitimate retailers.

That such ethical leadership has stimulated and will continue to stimulate public buying of appliances, installation work, and general supplies.

That it is the desire of the Pacific Gas and Electric Company to continue encouraging as many legitimate retail appliance dealers as can economically operate; to co-operate with such natural outlets by financing and executing constructive educational selling and advertising campaigns.

That merchants and dealers can and should retail appliances at prices fair to themselves and the public by such methods as have been found to be sound by successful retailers.

That the manufacturers and jobbers can best contribute to this plan by supplying well advertised merchandise of unquestionable quality at prices which permit the seller a legitimate profit margin.

The Pacific Gas and Electric Company will continue:

To keep an open mind. To be guided by facts. To hold out to all groups the right to full discussion. To hold to those policies we believe to be right but to quickly concede where we find we are wrong.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed
by Californians

245 Market Street
SAN FRANCISCO

H. M. CRAWFORD,
General Sales Manager.

Stauffer's

FERROX

Purifier

meets these essential requirements of a good Gas Purifier

A highly active Iron precipitate, with a high Iron content.
A thoroughly impregnated and porous bulky mass, ready to use, no delay, always uniform.

A dependable source of supply

Pioneer manufacturers of Industrial Chemicals on the Pacific Coast

Stauffer Chemical Company

624-638 California Street, San Francisco, California

PATENTED

Martin Unit Gas Furnaces

ARE THE RESULT OF 38 YEARS HEATING EXPERIENCE
MADE IN FOUR SIZES
Electric, Thermostat or Manual Control
Approved by A. G. A. Laboratory and by the City of Los Angeles
Write for your copy of "Modern Heating Methods"

PHILLIPS HEATING, VENTILATING & MFG. CO.
1710 W. Washington St.
Los Angeles, California

Live Agents Wanted

TESTING LABORATORY A.G.A. APPROVED

SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

Research Must Keep Pace

(*Continued from Page 22*)

on the switchboard; natural gas 950,000 B.t.u.'s per M.c.f. and costs at a point to be delivered into the distribution system 20 cents per M. The average theoretical cost compared with manufactured gas of 550,000 B.t.u.'s per M. would be as follows:

Manufactured Gas	550,000 B.t.u.'s	$ .30
Coal 46 pounds	550,000 B.t.u.'s	.094
Oil 4⅛ gallons	550,000 B.t.u.'s	.147
Natural Gas 580 cu. ft.	550,000 B.t.u.'s	.116
Electricity 161 KWH	550,000 B.t.u.'s	.805

Based on purely theoretical 100 per cent thermal efficiency of use at these purely and only output costs and not considering any collateral advantages, electricity would be entirely out of the competitive field and manufactured gas would also be out, but nevertheless would be 2.68 times better off than electricity. We know from experience that the purely theoretical figures do not apply—that both gas and electricity are extensively sold at many times the competitive prices mentioned in these purely theoretical output costs for purposes where the other fuel could be used.

It is a research problem to ascertain what competitive figures gas must be sold for in order to take the business and how to do it to the greatest extent. The present basis of output cost of gas and the present average investments and other costs preclude the gas industry from taking on all the business which it is believed rightfully belongs to it.

Looking over the theoretical figures of the competitive costs of fuel for the same number of heat units, one can readily appreciate the fact that both electricity and gas must do extensive research work in order to reduce the actual output costs of their products, with less loss of heat in the manufacture, and must also reduce overhead expense in every way, investment and otherwise.

Summing up—It is plain that it is a most difficult task to pick those research problems which are most important to the gas industry. From my viewpoint I think the most intensive study should be given to sales of gas, improving the load factor, etc., which of course means more application to the subjects in today's program besides much more concentration on many other problems which are not purely technical. The technical research must go along with the other problems and as aggressively, but as we have our present investment, production methods and costs, distribution and other factors controlling the present ultimate cost to the consumer, I believe we should concentrate as much as possible to improve the uses of gas based on our present conditions and then keep working diligently and aggressively to improve the fundamental conditions, affecting all costs of heat delivered to the prospective and present customers.

R. S. DURKEE IS NAMED TREASURER OF GENERAL PETROLEUM

Rodney S. Durkee of Los Angeles has been named director and treasurer of the General Petroleum Corporation of California, succeeding J. L. Barneson who recently resigned.

R. L. WELCH, SECRETARY OF A. P. I., DIES

Announcement was made of the death of Robert L. Welch at Phoenix, Arizona, on January 21. Mr. Welch was secretary of the American Petroleum Institute.

Employee Education

(*Continued from Page 29*)

Twelve subjects will be presented in six sessions. which will be held each Friday evening from March 1 to April 5. Some idea of the scope and character of the course can be gained from a glance at the list of subjects and authors, which follows:

"Steam vs. Hydro Power"—By J. G. Rollow.

"Business vs. Political Management of Public Utilities"—By Frank Weiss.

"Rates and Rate Making"—By Wm. Evans.

"The Regulation of Public Utilities"—By H. L. Masser.

"Public Utility History"—By H. J. Kister.

"Statistics"—By E. N. Simmons.

"Public Utility Financing"—By W. E. Houghton.

"Correct Utilization of Gas"—By W. M. Henderson.

"Commercial Practices"—By O. L. Moore.

"The Public Relations of Public Utilities"—By D. L. Scott.

"Load Building"—By Frank Weiss.

"Recent Developments in the Industry"—By G. A. Riley and R. C. Boughton.

Two final examinations will be held at the conclusion of the course. They will be open to all except executives, department heads and their principal assistants. One of these examinations will be of the "fill in" type, a large number of questions which can be answered by filling in blanks, crossing out words, etc., to be provided. The other examination will be a written discussion of a small number of topics.

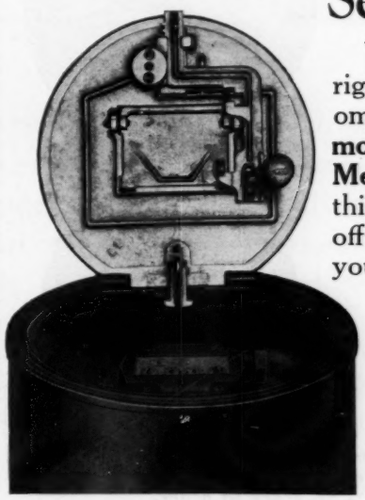
To lend zest to the course and help maintain interest, a series of prizes is being offered. In the topical course, the first prize will be a trip at the corporation's expense to the annual convention of either the Pacific Coast Gas Association or the Pacific Coast Electrical Association at Del Monte. A second prize of $25.00 will be given and other prizes ranging down to sufficient five-dollar cash prizes to equal one-tenth of the number of persons who take the final examination. The first prize for those who take the examination by the blank-filling method will be $25.00 in cash and other prizes will be offered based on the number who actually take the examination.

Several years ago we gave a somewhat similar course, topped with a trip to the Portland Convention. If our response in that effort was any criterion, we should have a great deal of interest in the present course in Public Utility Practices.

Employee Association Courses: Numerous courses of study have been conducted during the past three years under the direction of the Employees' Association. These courses have been well patronized. Special interest has been taken in the courses in public speaking. This interest has manifested itself also in the organization of several very excellent clubs—The After Hour Club, The Wranglers. The Eve's Hour Club, and more recently the First Aid Club, which is composed exclusively of those who have been members of first aid teams and is devoted to the promotion of safety and first aid efforts.

The Research Society: As a product of our public speaking activities, we have in our ranks a large number of people who can give a good account of themselves on the platform. A considerable number of these have formed what we call "The Research Society." This organization meets at din-

Under-ground Gravity Locked All Cast-Iron Meter Box Sent You FREE



You are stepping on your own rights—Yes, you are pushing "Economy" **down** — You are spending, **monthly,** unnecessary **dollars** for **Meter-Reading** if you are not using this box—and for these reasons we offer you free one of these boxes for your personal use—Wire or write.

The Leading Companies in the Southwest Specify this Box Because . . . . . .

Those leading companies who have used this box **continue the use because** it means economy and safety. Won't you save as they have saved? Will you profit by their experiments? Ask the Lone Star Gas Company, Community Natural Gas Company, Oklahoma Natural Gas Company for their opinions on our locked or unlocked boxes.

Cost of Box Is Nominal

RIVER CLAMPS, FLANGES; in fact, a complete line of **Gray Iron Castings** makes it possible for us to manufacture this **all cast-iron, gravity-locked, underground meter box** at a very low price. Your inquiry should be mailed today. You should personally examine this box. You should see it. Read your meter through a meter **reading door.**

We Also Make the Castings for The Webster Engineering Company.

Patents—Patended and Pending

Tulsa—Okla.—Sandsprings

Tulsa Stove & Foundry Co.

Mettler Entrained Combustion Gas Burners FOR ALL Purposes Kinds of gas Pressures

406 S. Main St. LEE B. METTLER, CO. Los Angeles, Cal.

EMPIRE
Oil Meters

Positive Displacement
Oscillating Piston Type

Simple in Construction—Easy to Operate—Low in Cost of Maintenance

EMPIRE meters are highly accurate, and **stay** accurate. They are invaluable for cracking and absorption processes; for gas companies; for refiners and distributors of gasoline and all distillates of petroleum; for measurement of crude oil, cold or hot.

ALL SIZES ⅝" TO 6"

Standard meters will withstand working pressures of 150 lbs. to the square inch. High pressure types will handle 300 lbs. Higher pressures and special types to order.

National Meter Company

299 Broadway, New York

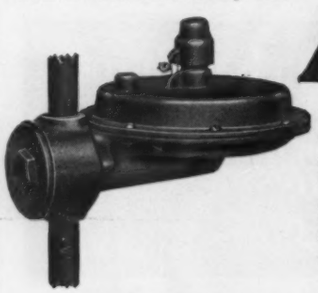
1048 Folsom Street, San Francisco **645 Santa Fe Avenue, Los Angeles**

We join with other members of the Pacific Coast Gas Association in welcoming to California the active leaders of the American Gas Association and of the nation's Gas industry, in this significant meeting of its Advisory Council and Executive Board

C. B. Babcock Co.

February 6th-7th, 1929 **San Francisco** **Los Angeles**

MODEL 10 SERIES
With or Without Mercury Seal



Spring Type
Also furnished in Dead Weight Type

Reynolds
Gas Control Since 1892

Products for all kinds of Pressure Reduction—for either artificial or natural gas.

GOVERNORS — Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic Quick Closing Anti Vacuum.

REYNOLDS GAS REGULATOR COMPANY
Anderson, Indiana

ner on the tenth of each month and engages in the study of some of the problems of the corporation which it is frequently desirable to have presented on the speaking platform. A typical program will illustrate:

"The Domestic Utilization of Gas"—By A. R. Bailey.

"Gas is Gas"—By Guy Corfield.

"The New Gas Rate"—By M. A. Seeley.

Safety and First Aid Education: Our Safety Department gives regular instruction in safety and first aid to the forces engaged in mechanical activities. Several first aid teams in frequent and spirited competition maintain a keen interest in that subject. The First Aid Club, previously referred to, will be an added factor in maintaining interest in safety and first aid matters.

"The Life Saver," a monthly publication issued by the Safety Department, takes the safety and first aid instruction directly into the homes of all employees.

Overhead and Underground: No survey of the educational program of Los Angeles Gas and Electric Corporation would be complete if it did not include "Overhead and Underground," our semi-monthly, four page tabloid. Overhead and Underground is not a magazine. It is purely a newspaper, and is devoted solely to our own interests. It is kept small purposely so that the story has a better chance of being read, and is issued twice a month in order that important announcements can be put over in time. Our little paper goes directly into the home and tells the story of our organization to all its members and their families.

Outside Facilities: Night schools of all grades and covering practically every subject are within reach of our entire personnel. These schools are taken advantage of to a remarkable extent. It is our aim to exploit the educational programs of these institutions and encourage our people to take advantage of the opportunity which they offer.

The Elements of Success: We feel that our educational activities have met with very gratifying success. We attribute this success first to the generous support accorded by our chief executive and the official staff. President Day has always lent his support both in his executive capacity and by personal co-operation. He has issued calls over his own name for some of our most important and difficult-to-organize activities, and has taken the leadership by presiding at some of our sessions. When we consider the advantage that prestige and a good start are to any enterprise, we realize how valuable has been his participation.

In the second place, we have worked to the fixed policy of presenting only importantant subjects, in the best manner possible. We find that the employee body, with very little exception, responds when there is something to respond to; and we are certain that so long as we live up to these specifications our success is assured.

SOUTHERN OREGON GAS CO. ANNOUNCES IMPROVEMENTS

Expanding business has made necessary several changes and improvements by the Southern Oregon Gas Company. Substantial improvements have been ordered in the Roseburg plant, according to M. R. Brown, the company's manager in that city. Two generators will be rebuilt and a replacement program of mains and fixtures is under way.

The Grant's Pass office of the company is moving into larger quarters in the old Post Office building of that city, the building being entirely remodeled for the purpose.

Welcome to the Pacific Coast

We extend sincere greetings to the delegates and other representatives of the American Gas Association, on the occasion of their conferences in Los Angeles, February 6th and 7th.

You cordially are invited to visit our properties and our offices while you are in Southern California.

Southern Counties Gas Company

The BARTLETT HAYWARD CO.
BALTIMORE *Engineers and Founders* NEW YORK

DESIGNERS AND BUILDERS
OF
COMPLETE COAL GAS PLANTS
CARBURETTED WATER GAS PLANTS
BY-PRODUCT PLANTS
DE BROUWER CHARGING AND DISCHARGING MACHINES
SALT WATER AND FRESH WATER CONDENSERS
PURIFIERS
SHAVING SCRUBBERS
CENTRIFUGAL VERTICAL TYPE SCRUBBERS
STEEL TANKS
VERTICAL WASTE HEAT BOILERS

GAS HOLDERS

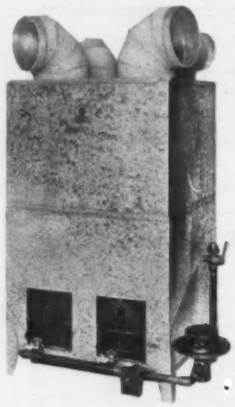
Gladding, McBean & Co.

FIRE BRICK

Manufacturers of a Full Line of High Grade
REFRACTORIES
For Boiler Settings, Industrial Furnaces, Dutch Ovens, Etc.

SHAPE WORK A SPECIALTY
Also Fire Clay Chimney Pipe, Chimney Tops,
Flue Linings, Gas Flues.

Los Angeles	Oakland	Fresno	San Francisco
621 So. Hope St.	22nd and Market	(San Joaquin	445 Ninth St.
TRinity 5761	Oakland 0262	Materials Co.)	Douglas 0540



Furnace Service

How much of your overhead is represented by unnecessary trips to your job?

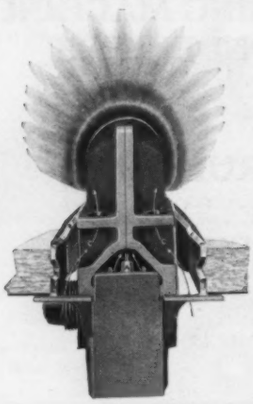
In other words does your furnace or your service man render your service?

Install **Perfection Multiple Unit Furnaces** and cut down on your overhead.

L. H. Freymuth Jr.

311 East Pico St., Los Angeles

R.M.C.



The gas burner with a snappy, high temperature flame

Rotary Manufacturing Co.

5720 Long Beach Avenue
LOS ANGELES

Industrial Sales

(*Continued from Page 24*)

business and exclude unprofitable business.

For the intermediate business, lying between the industrial and domestic, usually called commercial, and consisting of the neighborhood bakery, restaurant, small boilers for pressing machines, clothes manufacturers, and miscellaneous, small load, carrying a relatively higher value of service, a general commercial rate should be designed. This rate should carry relatively higher investment protection or demand charge, because the business served under it is fed from the low pressure distribution system and because commercial business is otherwise more expensive to handle than industrial business. The higher demand charge develops adequate revenue from the miscellaneous poor load factor commercial consumers, and a sufficiently low commodity charge makes the rate competitive with other fuels for the large, high load factor user of this class. Such a rate should be designed to work smoothly into the industrial rate without an abrupt transition point. This method of rate structure finds precedent in the electric business where it is general to have one rate for small miscellaneous power and another rate for large power. The greater investment per unit of capacity necessary for the smaller miscellaneous business together with the smaller use of that capacity makes the cost of service to small miscellaneous power customers considerably higher than to the large high load factor power user. It has the great advantage that the consumer is billed at the rate earned for him by his operating conditions, rather than put in a class because of the nature of his business. Irrespective, however, of whether the solution to the rate design problem lies in class rates or in one or more general rates, there should be embodied in the rate, protection to the company's investment which it is dedicating to public use. When the value of service to a class of business does not allow of including in the rate, in addition to the commodity cost, the out-of-pocket operating expenses to the company plus some portion of the overhead, it cannot be served profitably either to the company or to other consumers. As mentioned before, in the marketing of gas for industrial purposes, the determining factor is fuel economy, and designing the rate to give investment protection to the company does not make the rate any less competitive.

A public utility is primarily a sales organization engaged in selling service to the public. The nature and cost of the service demanded by and for the consumers in the smaller classes of business make the cost of the commodity itself dwindle into comparative insignificance. While this is not so pronounced in the larger high load factor classes of business, the cost of the service element is still important. For this reason calorific comparisons of gas with other fuels do not tell the entire story, and therefore, in selling our service we should know the ins and outs of every industry that uses heat—how, when and where it is used, necessary fuel handling costs, the degree of importance of interruptions to operation and consequent losses, spoilage chargeable to fuel, etc. It is surprising at times to what extent these indirect costs affect the over-all costs, and therefore their effect on the price which can be obtained for gas.

It is necessary that statements made to the prospective consumer come true in operation. This necessitates keeping in close touch with customers. Installations operating at

high pressure require the time-pressure-volume, charts be changed at least weekly. Ability on the part of the man changing these charts to periodically check flue gas analysis, take stack temperatures and check burner operation for those industries not large enough to employ competent engineers helps the company selling the gas to make and keep friends. Every industrial customer is a potential friend to the company and when we do not take advantage of this we are overlooking one of our best means of building a good public relationship.

TURKEY AND BEANS ARE FEATURE OF ANNUAL DINNER

Sales executives and salesmen from all points in the Southern Counties Gas Company's southern California system gathered on January 17 for the annual sales dinner of the company, held in Los Angeles. The meeting was arranged by the Department of Public Relations and Sales, headed by F. H. Bivens, vice-president of the company. Clyde H. Potter, general commercial agent, presided over the meeting, which was attended by nearly a hundred people.

The feature of the occasion was a "turkey and bean dinner," which came as the conclusion to a year's competition between sales crews and between various districts of the company. Losers paid for turkey for the winners, and ate beans as their portion.

Speakers of the evening were A. L. Spring, western manager for Servel Sales, Inc.; and C. B. Babcock, president of the C. B. Babcock Company.

A. G. A. LABORATORY APPROVES 10,877 APPLIANCES

The A. G. A. Testing Laboratory has placed its seal of approval on 10,877 appliances. Each of these has been tested for economy, safety and efficiency. They are divided as follows:

Gas-fired water heaters	258
Furnaces and boilers	281
Gas heaters	838
Gas stoves and ranges	9,500

MONTANA-DAKOTA POWER CO. ASKS FRANCHISE

Application for a 20-year franchise to serve 25 towns between Glasgow and Chester, Montana, with natural gas, has been filed by the Montana Dakota Gas Company. The company is planning to build a gas pipeline to follow the route of the Great Northern Railway, and the gas will be served from fields in the vicinity of the line, which will be 200 miles long.

CITIES SERVICE CO. GIVES GARNETT, KANS., STAND-BY SERVICE

Cities Service Gas Company's Industrial Department recently completed arrangements with the city officials of Garnett, Kansas., to furnish stand-by gas service. Garnett has been using gas locally, but because of a diminishing supply it became expedient to procure gas from an additional source during the cold months.

COMMUNITY NATURAL GAS CO. SERVES TEXAS-OKLA., TOWNS

Gas was turned into the city distribution system at Hugo, Oklahoma, by the Community Natural Gas Company, on December 27th. Other towns recently piped for gas are Maysville, Oklahoma; Powell, Kearns, and Groesbeck in Texas. The Community is now laying gas mains at Barry, Texas. Gas is also to be supplied by the company to Wylie, Texas, near Garland.

Dehydration

in its simplest form

Diagrammatic top view

THE PIONEER SEPARATOR

without a moving part, accomplishes the complete separation of liquids from gas or other vapors.

PIONEER EQUIPMENT CORPORATION
OF AMERICA
231 BROADWAY NEW YORK

California Representative
H. PLUMMER
806 Fife Building
San Francisco, California

Fire Brick Contractors

Established 1906

J. T. Thorpe & Son

Inc.

Specializing in Gas Generator, Boiler, Still and Furnace Brick, Industrial Furnaces, Retorts, Kilns, Brick Smokestacks.

A capable Engineering Department competent to advise on any problem involving firebrick construction.

San Francisco	Seattle	Portland	Los Angeles
417 Market St.	305 White Bldg.	609 Ry. Exch. Bldg.	321 W. 3rd St.

HOT-N-KOLD

The Hot-N-Kold Shops are now serving the public in eight cities in the northern part of California with Kelvinator Refrigeration, Holbrook Ranges, Welsbach Water Heaters, and other major appliances.

A valuable business franchise awaits the right dealer in every town.

HOT-N-KOLD CORPORATION

949 Mission Street San Francisco, California

GILFILLAN
Dual Control Valve Regulators

Write for literature

SAVE ONE INSTALLATION

Maintain a constant steam pressure on the boiler
and
Reduce and maintain an unvarying gas pressure to the burner regardless of the variation in line pressure.

Built to control Boiler pressure from one pound to 200 pounds steam, and deliver as low as two ounces gas pressure at the burner.

GILFILLAN MACHINE WORKS, Inc.
Ebenezer, Erie Co., N. Y.

Representatives
Jensen Instrument Co., 624 E. Fourth St., Los Angeles, Calif.
Gas Appliance Service Corp, 2014 Bryan St., Dallas, Texas.
The Diamond Supply Co., Charleston, W. Va.

The Magic Way Company

Gas Heating Devices

including

"Magic Way" Gas Furnaces
"Magic Way" Control Valves and Switches
"Potter" Radiators
"Steel Made" Radiators
"Cole" Floor and Wall Heaters
"Hall" Floor Furnaces

Manufactured by

Magic Way Company
National City San Diego California

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge.

HELP WANTED—MALE

Men interested in South American Work with large oil, mining companies who pay fare and expenses, write for our warranted service offer. South American Service Bureau, 14600 Alma, Detroit, Michigan.

Industrial and heating engineer. Midwestern natural gas company just opening new territory in Black Hills, South Dakota, desires technically trained man about 35 years of age with experience in heating and in application of gas to industrial processes and plants to develop industrial, commercial and heating sales. A-18, care of *Western Gas*, 124 West Fourth Street, Los Angeles, Calif.

House heating engineer. Midwestern natural gas company just opening new territory in Black Hills, South Dakota, desires technically trained man about 35 years of age with house heating experience to check and service existing furnace installations and to develop and organize such inspection in other towns now served. A-19, care of *Western Gas*, 124 West Fourth Street, Los Angeles, Calif.

Wanted—Several Domestic, Househeating and Industrial salesmen on properties in Utah, Idaho, Montana, and Colorado. Address L. H. Stratford, P. O. Box 268, Pocatello, Idaho.

FOR SALE—EQUIPMENT

For Sale—1000 reconditioned McDonald, Maryland, and Standard, 3 and 5 light prepay meters. These meters are in first class condition and will be equipped with appropriate rate wheels and painted to suit the purchaser. Price $7.25 each in hundred lots, f.o.b. cars, Portland, Oregon. Sample will be furnished willingly. *Portland Gas & Coke Company*, Public Service Building, Portland, Oregon.

SAN DIEGO CONSOLIDATED TO SELL COMMON STOCK

The California Railroad Commission has authorized the San Diego Consolidated Gas and Electric Company to issue $5,000,000 of common capital stock during the year 1929. Proceeds of the sale of the stock are for additions and betterments.

HAL GOODE RETURNS TO WICHITA, KANSAS, POST

Hal Goode of the Wichita Gas Company, who was formerly in charge of the installation of gas at Dexter, Kansas, has returned to the main office at Wichita and is now engaged in making surveys.

COMBINATION GAS & OIL BURNERS

FOR
ALL CLASSES OF FIRING
USING
LOW OR HIGH PRESSURE
NATURAL OR MANUFACTURED GAS
MECHANICAL, STEAM AND AIR
ATOMIZING OIL BURNERS

COMBUSTION EQUIPMENT
LEAHY
LOS ANGELES CAL. U.S.A.

To obtain the best efficiency, our equipment is designed and manufactured to meet all the requirements of each individual installation, such as Horizontal, Front, Rear and Vertical Firing.

For the correct firing on all makes of high and low pressure Steam Boilers, Stills, Kilns, Retorts, Industrial Furnaces, Water Heaters, Bake Ovens, Kettles, etc., write:

Leahy Manufacturing Co.

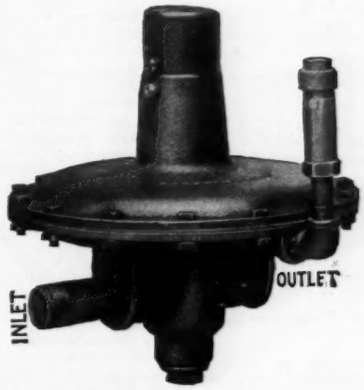
1804-1810 East 8th St., Los Angeles, Cal.

Established 1902

FULTON

Sensitive Service Governor

(SPRING STYLE)



Gives any desired delivery pressure regardless of Pressure fluctuations at inlet

THE FULTON Sensitive Service Governor is opened by a spring instead of lever and weight. This spring is constructed of special material and of a new design—it will not break or lose its elasticity. A simple turn to the right or left of the adjustment screw will give any desired pressure from 2 inches water to 6 ounces. The spring case can then be locked and sealed against tampering persons.

The FULTON Sensitive Service Governor (Spring Style) is particularly adapted for use on high pressure service lines connecting users directly with high pressure mains. It is extremely sensitive. Will control any intake pressure up to 100 lbs. and give any desired delivery, with practically no variation, no matter how greatly the inlet pressure may fluctuate.

The FULTON Sensitive Service Governor (Spring Style) is recommended for either Natural or Manufactured Gas.

WRITE for the Chaplin-Fulton 60-page catalog! It's free and contains data, on our many time-tested and proven gas regulators, that you will find invaluable in your work.

The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in all sizes, From 1 Inch to 24 Inches; For All Service. 1 oz. up to 1,600 lbs. Pressure to Square Inch.

28-40 Penn Avenue **Pittsburgh, Pa.**

REPRESENTATIVES:

WESTCOTT & GREIS, Inc. Sales and Service Dallas—Los Angeles—Tulsa

JNO. W. CRAWFORD Sales Engineer 1855 Industrial St., Los Angeles

A WESTERN GUIDE to INDUSTRIAL PURCHASING

Readers interested in any articles not listed in these pages are cordially invited to advise *Western Gas* of their wants and every effort will be made to furnish a list of the proper manufacturers. Addresses of companies listed on these pages may be found by consulting their advertisements in this issue.

Absorption and Compression Plant Equipment
Baker Iron Works.
Chaplin-Fulton Mfg. Co.
Jensen Instrument Co.
The E. A. Key Company
Western Pipe & Steel Co.

Absorption Towers
Baker Iron Works.
Western Pipe & Steel Co.

Adjustable Plugs
Western Pipe & Steel Co.

Agitators
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Aluminum Bronze Powder for Paint
Hill, Hubbell & Co.

Analyzers
Fort Worth Laboratories.
Smith-Emery Co.

Apparatus, Experimental Gas
The Bartlett Hayward Co.
Pacific Meter Works.

Appraisals and Valuations
Charles R. Collins.
Smith-Emery Co.
United Engineers & Constructors, Inc.

Bags, Gas Main
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Barometers
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
Westcott & Greis, Inc.

Bench Iron Work
The Bartlett Hayward Co.
General Gas Light Co.

Blocks and Tiles, Fire Clay
Gladding, McBean & Co.
Stockton Fire Brick Co.

Blowers and Boosters
Ingersoll-Rand Co.
Connersville Blower Co.
The P. H. & F. M. Roots Co.
United Engineers & Constructors, Inc.

Boiler Controls
The Cleveland Heater Co.
Gilfillan Machine Works, Inc.

Boiler—Brickwork
J. T. Thorpe & Son, Inc.

Boiler Equipment
E. A. Key Co.

Boiler Maker's Tools
E. A. Key Co.

Boilers, Gas-Fired
American Radiator Co.
C. B. Babcock Co.
Baker Iron Works.
Leahy Mfg. Co.

Boiler Settings, Pipe and Boiler Insulation
J. T. Thorpe & Son, Inc.

Boilers, Waste Heat
Baker Iron Works.
The Bartlett Hayward Co.
Phillips Heating, Ventilating & Mfg. Co.
United Engineers & Constructors, Inc.

Boilers, Water Tube
Baker Iron Works.
Western Pipe & Steel Co.

Breakers
Ingersoll-Rand Co.

Breeching (Boiler and Stack)
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Brick, Firebrick
Gladding, McBean & Co.
Stockton Fire Brick Co.
United Engineers & Constructors, Inc.

Brick, Firebrick—Installation
J. T. Thorpe & Son, Inc.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Buildings, Steel
Baker Iron Works.
United Engineers & Constructors, Inc.
Western Pipe & Steel Co.

Bunkers, Steel and Concrete
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Burners, High Pressure
Leahy Mfg. Co.
Lee B. Mettler.
Rotary Manufacturing Co.

Burners, Low Pressure
C. B. Babcock Co.
The Bartlett Hayward Co.
Duro Gas Burner Company.
L. H. Freymuth
General Gas Light Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Lee B. Mettler.
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
Rotary Manufacturing Co.
Western Pipe & Steel Co.

Burners—Oil
Leahy Mfg. Co.
Rotary Manufacturing Co.

By-Product Recovery Apparatus
The Bartlett Hayward Co.

Calorimeter Accessories
Fort Worth Laboratories.
Pacific Meter Works.
United Engineers & Constructors, Inc.

Cases, Meter
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Casinghead, Gas Meters
The Bristol Company
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.

Casing and Tubing (steel)
South Chester Tube Co.

Casing—Iron
South Chester Tube Company

Cast Iron Pipe
United States Cast Iron Pipe and Foundry Co.

Castings
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Cement
Stockton Fire Brick Co.

Cement, High Temperature
Stockton Fire Brick Co.

Centrifugal Pipe
United States Cast Iron Pipe and Foundry Co.

Charging Machines (retort, etc.)
The Bartlett Hayward Co.

Checker Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Chemical and Gas Testing Apparatus
Fort Worth Laboratories.
Pacific Meter Works.
Stauffer Chemical Co.
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Chemists, Analytical
Fort Worth Laboratories.
Smith-Emery Co.

Chimneys, Radial Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Chimneys, Radial Brick Installation
J. T. Thorpe & Son, Inc.

Chutes (coal, coke, ash)
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Clamps and Sleeves, Pipe
S. R. Dresser Mfg. Co.
Mueller Co.

Clamps, Service
Mueller Co.

Cleaners, Service
C. B. Babcock Co.
Pacific Meter Works.

Coal Gas Plants
Charles R. Collins.
The Bartlett Hayward Co.

Cocks
C. B. Babcock Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Merco Nordstrom Valve Co.
Mueller Co.
Geo. D. Roper Corporation.

Collectors, Dust
Western Pipe & Steel Co.

Compressors, Air
Ingersoll-Rand Co.
Leahy Mfg. Co.

Compressors, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, High Pressure
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, Portable
Ingersoll-Rand Co.

Condensers
Baker Iron Works.
The Bartlett Hayward Co.
Ingersoll-Rand Co.

Condenser Boxes
Baker Iron Works.

Controllers
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
The Foxboro Co., Inc.
Robertshaw Thermostat Co.

Controls, Air and Steam
The Bartlett Hayward Co.
The Bristol Company
The Foxboro Co., Inc.
Jensen Instrument Co.

Cooling Systems
The Bartlett Hayward Co.

Cooling Towers
J. B. Gill Corporation.

Counters, Revolution
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.

Couplings
S. R. Dresser Mfg. Co.
The Bartlett Hayward Co.

Couplings—Flexible Rope & Spider Arm
The P. H. & F. M. Roots Co.

Coverings (Flat and Corrugated)
L. H. Freymuth

Cubic Foot Bottle
Pacific Meter Works.

Cutters, Pavement
Ingersoll-Rand Co.

Cylinders, Compressors
The C. & G. Cooper Co.

Danger Signals
Safety Gas Main Stopper Co.

Dephlegmaters
Western Pipe & Steel Co.

Diaphragms, Meter
Chaplin-Fulton Mfg. Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Diggers, Clay
Ingersoll-Rand Co.

Discharging Machines (retort, etc.)
The Bartlett Hayward Co.

Door, Clean-out
Baker Iron Works.

Drills
Ingersoll-Rand Co.
Mueller Co.

Drill Pipe—Iron
South Chester Tube Company

Drill Pipe—Steel
South Chester Tube Company

Dryers—Laundry
W. E. Lamneck Co.

Elevators
Baker Iron Works.

Engineers and Engineering Service
Charles R. Collins.
J. B. Gill Corporation.
The Bartlett Hayward Co.
Smith-Emery Co.
United Engineers & Constructors, Inc.
Western Pipe & Steel Co.

Engines, Diesel
The C. & G. Cooper Co.

Engines, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.
United Engineers & Constructors, Inc.

Engines, Oil
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Engines, Steam
Ingersoll-Rand Co.

Evaporating Apparatus
The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Excavators, Ditch and Trench
The Cleveland Trencher Co.

Exchangers, Heat
Baker Iron Works.
Western Pipe & Steel Co.

Exhausters
Connersville Blower Co.
Ingersoll-Rand Co.
United Engineers & Constructors, Inc.
United States Cast Iron Pipe and Foundry Co.
The P. H. & F. M. Roots Co.

Experimental Apparatus
The Bartlett Hayward Co.
Pacific Meter Works.

Filters
United States Cast Iron Pipe and Foundry Co.

Fire Clay and Products
Gladding, McBean & Co.
Stockton Fire Brick Co.

Fire Brick Contractors
J. T. Thorpe & Son, Inc.
Stockton Fire Brick Co.

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The Bartlett Hayward Co.
United States Cast Iron Pipe and Foundry Co.

Fixtures, Lighting (Domes, Portables, etc.)
C. B. Babcock Co.
Welsbach Company.

Fire Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Flanges
Pittsburgh Equitable Meter Co
Westcott & Greis, Inc.

Forgings
Baker Iron Works.
Payne Furnace & Supply Co.
Geo. D. Roper Corporation.
J. T. Thorpe & Son, Inc.

Furnaces, Floor
Electrogas Furnace Co.
Magic Way Company
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.

Furnaces, Heating
The Estate Stove Co.
L. H. Freymuth
Payne Furnace & Supply Co.
Magic Way Company.
Pacific Gas Radiator Co.
Phillips Heating, Ventilating & Mfg. Co.

Furnaces, Industrial
C. B. Babcock Co.
Johnson Gas Appliance Co.
Leahy Mfg. Co.
Mueller Co.
Payne Furnace & Supply Co.

Gas Analysis Apparatus
The Foxboro Co., Inc.
Fort Worth Laboratories.
Jensen Instrument Co.
Pacific Meter Works.
United Engineers & Constructors, Inc.

Gas Masks
Safety Gas Main Stopper Co.

Gas Main Tapping & Drilling Machines
Mueller Co.

Gaskets
The E. A. Key Company
Pittsburgh Equitable Meter Co
Safety Gas Main Stopper Co.
Southwestern Pipe Joint and Engineering Co.

Gasket Compound
E. A. Key Co.

Gas Pipe Line Construction
Western Pipe & Steel Co.

Gates—Wind & Blast
The P. H. & F. M. Roots Co.

Gauges
The Bristol Company
Fort Worth Laboratories.
The Foxboro Co., Inc.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Westcott & Gries, Inc.

Gauges, Steam
The Bristol Company
Jensen Instrument Co.
The Foxboro Co., Inc.
Westcott & Gries, Inc.

Gauges, U Type
C. B. Babcock Co.
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
Lee B. Mettler.
Pacific Meter Works.
Safety Gas Main Stopper Co.
The Foxboro Co., Inc.
Westcott & Gries, Inc.

Generators, Water Gas
The Bartlett Hayward Co.
Baker Iron Works.

Glassware
Fort Worth Laboratories.
Westcott & Gries, Inc.

Governors
C. B. Babcock Co.
Chaplin-Fulton Mfg. Co.
L. H. Freymuth
Pacific Meter Works.
Reynolds Gas Regulator Co.
Sprague Meter Co.
Westcott & Greis, Inc.

Hammers
Ingersoll-Rand Co.

Hanger, Meter
Mueller Co.

Hangers, Iron and Steel
Baker Iron Works.

Heaters
American Radiator Co.
C. B. Babcock Co.
Baker Iron Works.
The Estate Stove Co.
L. H. Freymuth
General Gas Light Co.
Magic Way Company.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
Welsbach Company.

Heaters, Floor
General Gas Light Co.
Magic Way Company.
Pacific Gas Radiator Co.
Payne Furnace & Supply Co.

Heaters, Wall
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General Gas Light Co.
Magic Way Company.
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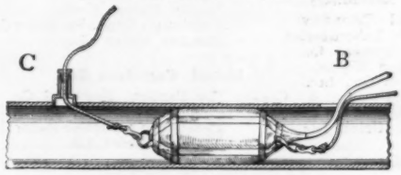

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Western Pipe & Steel Co.

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Ingersoll-Rand Co.

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Stockton Fire Brick Co.

Joint Runners Asbestos
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Mueller Co.

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Tappan Stove Co.

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Welsbach Company.

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A. O. Smith Corporation
South Chester Tube Company

Linings—Brickwork
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Mueller Co.
Safety Gas Main Stopper Co.

Mains, Street
United Engineers & Constructors, Inc.
United States Cast Iron Pipe and Foundry Co

Main, Stopper
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Mantles, Gas Lighting
C. B. Babcock Co.
General Gas Light Co.
Welsbach Company.

Manometers
Fort Worth Laboratories.
Jensen Instrument Co.
Lee B. Mettler.
Westcott & Greis, Inc.

Meters, Air
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Connersville Blower Co.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.
The P. H. & F. M. Roots Co.
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Meters, Boiler
The Bristol Company
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.

Meters, Burner Test
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Cast Iron Gas
The Bartlett Hayward Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meter Connections
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Complaint
Pittsburgh Equitable Meter Co

Meters, Consumers
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Flow
The Foxboro Co., Inc.
Jensen Instrument Co.
Pittsburgh Equitable Meter Co
Westcott & Greis, Inc.

Meters, Fluid
The Bristol Company
The Foxboro Co., Inc.
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Company
Westcott & Gries, Inc.

Meters, Gas
Connersville Blower Co
Jensen Instrument Co.
National Meter Company
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.
The P. H. & F. M. Roots Co.

Meters, Gasoline and Oil
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Co
Westcott & Gries, Inc.

Meters, High Pressure Distribution
The Bristol Company
Fort Worth Laboratories.
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Co
Pacific Meter Works.
Sprague Meter Co.
The Foxboro Co., Inc.

Meters, High Pressure Iron Case
The E. A. Key Company
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Industrial Consumers
The Bristol Company
Connersville Blower Co.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.
The Foxboro Co., Inc.
The P. H. & F. M. Roots Co

Meters, Iron Case
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Laboratory
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.
Westcott & Greis, Inc.

Meters, Large Capacity
Connersville Blower Co.
Jensen Instrument Co.
Pacific Meter Works.
Sprague Meter Co.
The P. H. & F. M. Roots Co.
Westcott & Greis, Inc.

Meters, Oil
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The Foxboro Co., Inc.
Jensen Instrument Co.
National Meter Company
Pittsburgh Equitable Meter Co
The P. H. & F. M. Roots Co.
Westcott & Greis, Inc.

Meters, Orifice
Jensen Instrument Co.
Pacific Meter Works.
Robinson Orifice Fitting Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Meters, Oxygen
Fort Worth Laboratories.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Oxygen and Hydrogen
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Prepayment
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Sprague Meter Co.

Meters, Station
Connersville Blower Co.
The Bartlett Hayward Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The P. H. & F. M. Roots Co.

Meters, Steam
The Bristol Company
Jensen Instrument Co.
The Foxboro Co., Inc.
United Engineers & Constructors, Inc.
Westcott & Greis, Inc.

Meters, Test
Fort Worth Laboratories
Pacific Meter Works.
Sprague Meter Co.
Westcott & Greis, Inc.

Meters, Water
Jensen Instrument Co.
National Meter Company
Westcott & Greis, Inc.

Meters, Wet Test
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Mixers, Gas and Air
C. B. Babcock Co.
Geo. D. Roper Corporation.
Pacific Gas Radiator Co.

Oil, Diaphragm
Pacific Meter Works.

Over Heat Control
Robertshaw Thermostat Co.

Oxide
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Stauffer Chemical Co.

Packing, Asbestos
Safety Gas Main Stopper Co.

Paint
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Hill, Hubbell & Company.
McEverlast, Inc.
United Engineers & Constructors, Inc.

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United Engineers & Constructors, Inc.

Pilots
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Spencer Thermostat Co.
L. H. Freymuth

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Western Pipe & Steel Co.

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United States Cast Iron Pipe and Foundry Co.

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Western Pipe & Steel Co.

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United States Cast Iron Pipe and Foundry Co.

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Pacific Meter Works.
Pittsburgh Equitable Meter Co

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Pumps—Liquid
The P. H. & F. M. Roots Co.

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Pacific Gas Radiator Co.

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The Estate Stove Co.
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Tappan Stove Co.

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Geo. D. Roper Corp.
Tappan Stove Co.

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Western Pipe & Steel Co.

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Jensen Instrument Co.
Pittsburgh Equitable Meter Co
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Westcott & Greis, Inc.

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Ingersoll-Rand Co.

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Magic Way Company.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.
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Mueller Co.
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The Bristol Company
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Mueller Co.
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Sprague Meter Co.
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Westcott & Greis, Inc.

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Magic Way Company.
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Phillips Heating, Ventilating & Mfg. Co.
The Foxboro Co., Inc.
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Western Pipe & Steel Co.

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Stops, Iron Body
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Strainer, Gas, Water, Air, and Oil
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Magic Way Company.
Payne Furnace & Supply Co.
Phillips Heating, Ventilating & Mfg. Co.

Systems, Hot Water Heat Control
The Cleveland Heater Co.
Mueller Co.

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The Foxboro Co., Inc.

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Thermometers (Indicating and Recording, etc.)
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Jensen Instrument Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

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The Bristol Company
Magic Way Company.

Valves, Gas Engine
The C. & G. Cooper Co.

Valves, Gate
Baker Iron Works.
The Bartlett Hayward Co.

Valves, Needle for Gas Stoves
C. B. Babcock Co.

Valves, Relief
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Chaplin-Fulton Mfg. Co.
Jensen Instrument Co.
Leahy Mfg. Co.
Mueller Co.
Reynolds Gas Regulator Co.
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Merco Nordstrom Valve Co.

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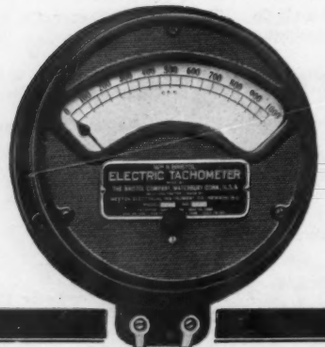

Bristol's Indicating Electric Tachometer may be used separately, or in combination with a recorder, and mounted in any convenient location.

Uniform Gas Pressure in the Distribution System . . . . . .

To insure maintenance of proper gas pressures about the distribution system it is necessary to make sure that boosters, both at the station and in district stations, are operating efficiently.

—which means that operatives should have some dependable means of determining the constancy of booster speeds.

The exact speed being maintained is shown at all times by Bristol's Electric Indicating Tachometer. Operatives have only to glance at the instrument occasionally to know whether or not boosters are running at a rate which insures maintenance of proper pressures throughout the entire distribution system.

The usual features of Bristol's ruggedness and simplicity of operation are contained in this type of instrument—insuring trouble-free service almost indefinitely.

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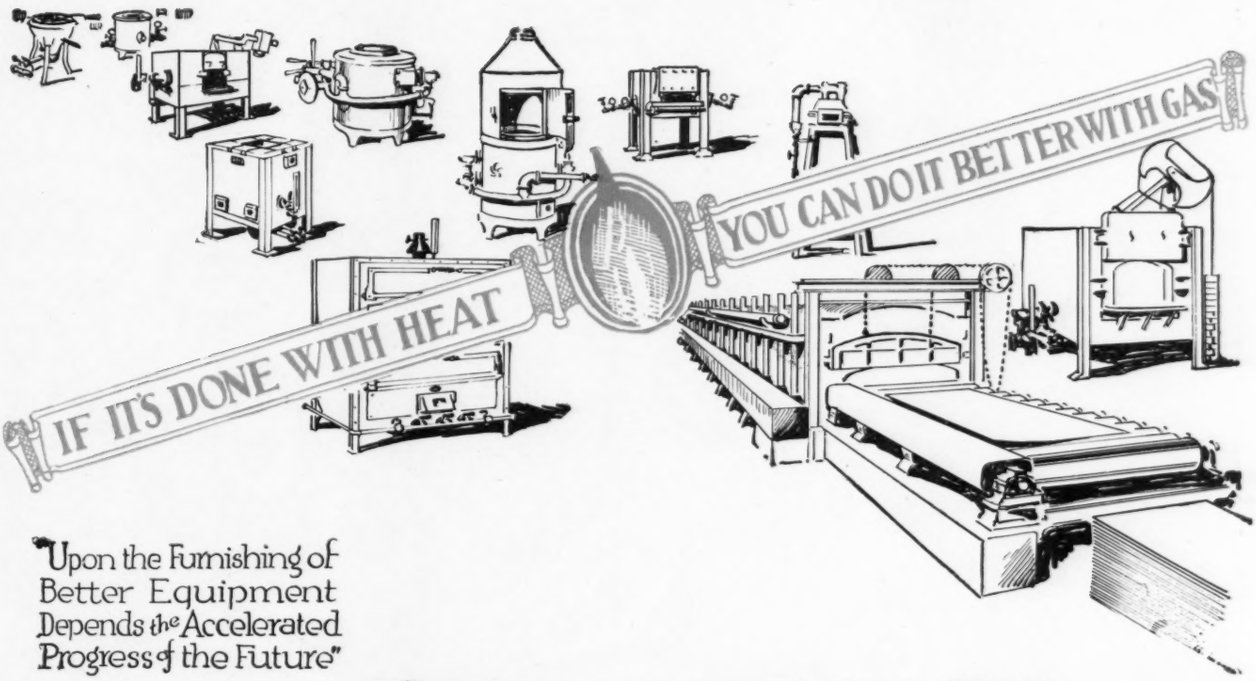

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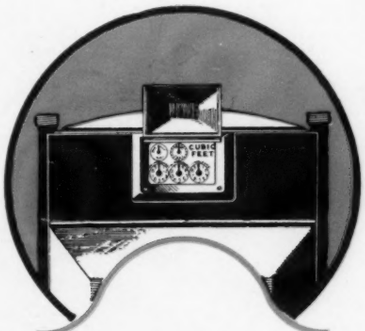

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